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REVIEW OF THE PRINCIPAL FACTS HITHERTO ASCERTAINED CONCERNING *BACTERIA*, WITH THE SPECIAL OBJECT OF NOTING THEIR INFLUENCE UPON THE HIGHEST ANIMAL ORGANISMS.*

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IN bringing before your notice a subject of this nature, I am endeavouring to show the vast importance of Biological studies to the members of our profession. I have spent much time in ascertaining the views of the leading authorities upon the subject—English, French, and German; and that this paper may have more value, I have affixed to each of the principal statements in it the authority to which I owe the information (where possible the English translation or summary). These will serve to indicate, to a certain extent, the works I have consulted, but wherever, I was enabled I have read the author's own paper or work rather than trust to the statements of summaries or reviews. You will see that I have handled my matter after the manner of a student, and you will doubtless not regret that I have not presumed to speak as a master on a subject which requires for its due elucidation experimental experience, and long years of

* Read before the Central Veterinary Medical Society, May, 1879.

thought. Unless, however, I am much mistaken, I shall not fail to direct in a new channel the thoughts of those who have not made this matter a special study, and I hope, too, to show them something of which they will not wish to be ignorant. In the general run of professional detail, neither time nor opportunity is given for research through numerous scientific periodicals; so I have thought I could be of service by collecting information on Bacteria, reducing it to order, striking out theory, and giving due prominence to each fact according to its importance, showing its bearings on leading problems and practical difficulties—in fact, by preparing and serving it up in such a manner as may render it most palatable and best adapted for hasty and easy mental digestion.

Every successive stage in the march of scientific progress seems to draw more closely the ties which unite medicine and surgery on the one hand, and, on the other, that branch of knowledge which has recently received the distinctive name, Biology. Men begin to see the grand principle of unity which lies beneath the apparent complexity of life, begin to understand that research must be from the general simple forms to the special and more differentiated, that if we would be in a position to appreciate life in the higher animals we must know more of it, not only in the lowest animals, but also in the vegetable organisms. Until we are much better assured than now of the conditions of life in its simplest form, we shall not be in a position to successfully combat its perverted conditions as occurring in disease. The knowledge that the most remarkable phenomena of the body are accomplished by the action of cells which "live, grow and have their being" in no direct relation with the body as a whole, but depend upon the co-operating structures, and the general vitality, only for their conditions of existence, leads us to think carefully about the lives of beings resembling them somewhat, if only in simplicity; and we conclude that, however minute a being, its life is not "flat, stale, and unprofitable." But my subject also derives interest from the fact that minute organisms enter into the systems of their immeasurably higher fellow-creatures in countless myriads, and by force of numbers bring about disorganization—some say even starve their victim into

submission. Not content with this, the Bacterian army, like the *Fama* of Virgil—

"Mobilitate viget, viresque acquirit eundo"—

and hecatombs of victims testify to its prowess.

My subject, too, leads us towards an inquiry into *putrefaction*, which is attributed to the influence of microscopic organisms: hence we might ramble to the undoubtedly valuable modification which *Lister* has brought before the world as "Antiseptic Surgery," and has based upon the presence of living ferments in the atmosphere—others base its beneficial influence upon the combat with particles which, according to the *germ theory*, are omnipresent. From a brief notice of this view, we are naturally led to a passing remark or two on the question of *Spontaneous Generation*, and the *Origin of Life*. It must not be imagined that within the limits of this paper I am going to attempt to discuss all the bearings of Bacteria, but I shall need, in the course of my remarks, to allude to prevalent theories, and to that which is provisionally accepted in the importaut matters above-mentioned. Such being the surroundings of the subject, I hope to be enabled to interest you in the investigation of Bacteroid organisms—minute bodies which have been considered devoid of life, and which have been alternately thought animal and vegetable—indeed, frequently are considered not sufficiently differentiated to exhibit characters distinctively animal or vegetable—on the verge of the extreme present limits of artificial vision, on the borderland between the living and the dead, but, withal, forming the centre on which mighty questions hinge—such are the bodies with which I have to deal.

If an organic infusion be exposed to the atmosphere, especially at a somewhat elevated temperature, it will, after a time, acquire upon its surface a pellicle, microscopic examination of which will show, besides various fungi (as *Mucor* and *Penicillium*). gelatinous masses, containing, disseminated through them, a number of somewhat bright bodies of more solid substance. The solution below the pellicle is undergoing decomposition; the gelatinous layer has, from *Pasteur*, received the name of

Mycoderma. In the fluid below will be found bodies of a cellular and others of a granular nature, *inter alia* elongated, highly refractive bodies, detectible by magnification 500 times, capable of spontaneous movement, and multiplying chiefly by transverse fission: these are *Bacterium termo*—the organism on the presence and vital action of which putrefaction is said to depend. The rapid movements of this protophyte have been attributed, by Messrs. Dallinger and Drysdale, to flagella, or whip-like processes, placed at the poles of the body, their diameter being given as $\frac{1}{210,000}$ of an inch (in the spirillum form).* Some animalcules—as Infusoria—are found in putrefying solutions; but they and the fungi are secondary, for the direct agency of Bacteria in causing putrefaction stands proved by the following arguments:—

1. They are invariably present when putrefaction occurs.
2. Means which prevent their access or development are antiseptic.
3. In proportion to the rapidity of their development is the rate of putrefactive decomposition.
4. Addition of Bacteria to a previously undecomposed organic solution suffices to cause rapid putrefaction.
5. The addition of no known substance devoid of Bacteria can produce the same effect.

The conditions which are required for the development of these organisms are:—

1. The presence of oxygen.†
2. A temperature between 18°C. and 60°-62°C. (Cohn) for persistence of vitality; between 5½°C. and 35°C. for reproduction.†
3. Moisture.
4. Carbonaceous and nitrogenous matters.

If either of these conditions be absent no decomposition of a putrefactive nature will occur, but the food supplied for its growth is not necessarily organic, for experimenters are accustomed to use for Bacterial development certain "cultivating solutions," consisting of ammonium salts—generally the tartrate—sugar, and certain salines. Citric acid may replace the tartaric, but no other vegetable acid is useful. The following are three such solutions:—

* British Association Report, 1878.
† Howarth and Eidam. *Quarterly Journal of Microscopical Science*, N.S., vol. xvi., p. 277.

Cohn's.		*Pasteur's.*	
Potass. phosph. ...	1·0 pts.	Pot. phosph. ...	20 pts.
Magnesiæ sulph. ...	1·0 „	Calc. phosph. ...	2 „
Ammoniæ tart. ...	2·0 „	Mag. sulph. ...	2 „
Calcii chloridi ...	0·1 „	Amm. tart. ...	100 „
Aquæ dist. ...	...200·0 „	Cane sugar ...	1,500 „
Mft. Soln.		Water ...	... 8,576 „
			10,200 „

Lister's.

Water from the tap ...	... 5,000 grs.
Salts from wood ashes	... 5 „
Lump sugar	... 250 „
Ammon. tart.	... 50 „
Mft. Soln.	

The result of the vital activity of these minute organisms is that the nitrogenous matters are consumed and certain gases are set free. In the case of organic matter the principal products are carbonic anhydride, sulphuretted hydrogen, and ammonia; in the case of nutritive solutions—if sugar is present—carbonic anhydride, glycerine, acetic, butyric, and succinic acids; if only tartaric and citric acids, without sugar—formic, acetic, and butyric acids result.*

When the nitrogenous matter of the substratum in which they have developed begins to "run short," the Bacteria assume the *Zooglea* state, which seems to depend upon swelling of their membranes, in which, as a gelatinous matrix, the bacterial particles become embedded; in this form they collect on the surface to constitute the pellicle, and, some say, still undergo multiplication. As the fluid basis beneath evaporates, the refractive bodies escape from their gelatinous coating and pass into the air, probably as minute globular masses, which surround the bodies of higher beings on every side, are introduced by every way into the animal system, and are ready at any time, when fit conditions arise, to generate putrefaction. In the early stages of putrefaction *Micrococci* first appear: these are spherical granules often apparently connected together by an intercellular substance, capable of motion and multiplication by transverse fission, the process often being so incomplete that the resulting portions remain adherent in a rosary-like chain, constituting the *Leptothrix form.*

* Bucholz. *Archiv für Exp. Path.*, B. vi., § 81.

These have been considered the earliest phases of *B. termo*, but we are not yet in a position to state absolutely that this is so.

We must not neglect to state that there are other theories upon the nature of Putrefaction than that which is known as the "Vital." Substances which most readily undergo putrefaction are those which contain most water, or elementary particles in such a state as to very readily combine together to form water. Also nitrogenous matters are very prone to undergo this change, and nitrogen is remarkable for the laxity of its chemical unions. Substances which most rapidly putrefy are generally remarkable for the complexity of their component molecules, and the large number of atoms of their composing elements: all these facts tend to support the "*Chemical Theory*" of putrefaction. It may also be noted that the rapid removal of watery matters, as by carbolic acid and drying, tends to prevent decomposition; also, agents which solidify albuminoids exert an antiseptic action on organic substances, generally by dehydration. It seems from these facts that by certain means we are enabled to prevent organic matter from affording due pabulum to the Bacterids, but they may also be explained on the theory that staple compounds result from dehydration, such as are not likely to undergo those complex molecular modifications which constitute putrefaction, and which result in the production of those chemical combinations which are most permanent under the surrounding conditions. Dr. B. W. Richardson believes that putrefaction is not due to the mere action of atmospheric oxygen, as was supposed, but to decomposition of water included in the tissues, and the action of the oxygen thus set free in *statû nascente*.* Hence fixing, removal, or condensation of the water in the tissues are preservative processes. "*Liebig's Theory*" is that "when the vital force has ceased to control organic combinations, the nitrogen of the albuminous bodies, by its affinity for hydrogen, decomposes the water of the tissues with formation of ammonia." It is found that free access of air is not essential, for putrefactive decomposition occurring in animal matter, which, when fresh, was completely embedded in paraffin. And it has been observed that

* Cantor Lectures. *Medical Examiner*, 1878, p. 300.

free access of air does not necessarily produce putrefaction; and hence it is argued, in opposition to the above chemical theories, "that albuminoid matters do not in themselves possess the power of self-destruction." *Dr. Roberts*, at the Manchester Meeting of the British Medical Association, said, "Organic matter has no inherent power of generating Bacteria, and no inherent power of passing into decomposition; Bacteria are the actual agents of decomposition."* *Bastian* tells us, "In Liebig's time a ferment was regarded as a portion of organic matter (not necessarily living) in a state of molecular change ('motor decay'), which by virtue of its own unstable nature was capable of communicating molecular movement (chemical change) to other unstable or fermentible mixtures." And, "Units of living matter are not sole ferments, since fermentation and putrefaction may be initiated in their absence; and since it can be shown that mere particles or fragments of organic matter can act in this capacity,"† some have described the germs of Bacteria as such particles, mere "*Splitterchen*" of Bacteria; but we shall see reason to think otherwise.

(To be continued.)

PURPURA HÆMORRHAGICA.

BY ALFRED BROAD, M.R.C.V.S., LONDON.

THE condition of blood peculiar to this interesting disease, and from which it derives its name, is produced, doubtless, by some hindrance or change in the action of the excretory organs—the skin, liver, or kidneys; and though in the human subject it is sometimes met with as a simple affection, with our patients it is usually a more or less formidable sequel of a debilitating disease. This is a cause which the following case well illustrates, as the appearance of the horse, and course of the ailment preceding the purpuric symptoms, so clearly indicated defective purification, as well as mal-nutrition of the blood. It is, however, the rather unusual manner of the development of the disease which is the point of interest in this instance.

* *Lancet*, 1878, i., p. 306.
† Paper read before the Pathological Society. See *Veterinarian*, 1875.

The subject of the case was a Bay Gelding, seven years old, very recently purchased. It had a hard run with hounds while out of condition, and after a few days' interval was driven a long day's journey. It then remained standing at livery, and was not worked for two or three weeks. I first saw the patient on the 31st of March last; it was said to have had a cold for some time, and the owner of the stable attributed all to the two days' work, saying the horse had not been well since.

The symptoms were:—dullness, loss of appetite, staring coat, and general unhealthy appearance, a hard frequent cough and difficulty in expiration, but the number of respirations was not more than sixteen or eighteen per minute; the pulse was forty-eight. The following treatment was carried out: throat stimulated, also mustard applied to the sides on two occasions, legs bandaged and hygienic conditions attended to generally; a dose or two of Ol. Lini, with saline, and stimulant medicines were given; also soft food, and oatmeal gruel by bottle. At the end of a week the condition of the patient was far from satisfactory; the appetite was a little improved, and the breathing easier, but a cough remained; the pulse had not altered, and the lustreless, hollow appearance was quite as marked. Fearing that Farcy or pulmonary complications would supervene in consequence of debility, I commenced the administration of Ferri Sulph. two drachms twice daily, as well as the Liq. Amm. Acet. On the tenth day I detected five or six extremely minute petechiæ on each Schneiderian membrane, and, the exact conditions of the case being then apparent, I gave, in place of all other medicines, two drams of Sulphuric Acid morning and evening, well diluted with gruel or water, changing it occasionally for four drams of Tinct. Ferri Perchlor.

In two days the nasal ecchymoses extended over all the visible portion of the membranes, and were larger and deeper in colour; a swelling of the size and shape of a hen's egg now formed over the nasal bones, and there was slight "filling" of the lower parts of the limbs. A concurrent symptom I will not omit, was the presence of sores in the hind heels, in no way differing from ordinary "cracks" or "chaps," and which caused great pain and difficulty in moving for three or four days. Though there was

exudation into the extremities from the knees and stifles downwards, it was slight compared with the engorgement common in this complaint, and no further hæmorrhagic effusions appeared in any other part. I have scarcely ever met with an instance of this disease in which so little tumefaction was present; but though the degree of tenuity of the blood was comparatively small, the amount of septic change which it had undergone appeared more than common. The absence of excessive swelling of the air passages and extremities was a favourable feature, as respiration and locomotion were not seriously interfered with, neither was there any impediment to feeding, because of the tumefied state of the cheeks and lips, as in the majority of cases. The patches of ecchymoses on the Schneiderian membrane soon presented a most virulent appearance, becoming large and confluent, and covering nearly the whole of the mucous membrane; their colour was of the deepest purple.

I next noticed circular elevations on the skin on the outside of the arms, and on the thighs inside and outside, varying from the size of a sixpence to that of a pea; while below the hocks they were smaller and in clusters. There was no perceptible exudation. Most of the swellings situated above the hock were of the extreme size, and projected clearly above the surrounding parts of the skin, with a flat surface. Upon close examination they were found to be dense crusts, with thick but sharply defined margins, and the hairs included in each were erect. On lifting one at the edge, a black mass of blood was disclosed; but a day or two later, when they were more easily raised, a perfectly healthy granulating surface appeared beneath them. If let alone they gradually became detached, and left small irregular black cicatrices; the crust I removed was rather more than an eighth of an inch in thickness, and included the hairs in the dense layers of epidermis.

About the twenty-fourth day, during the course of these symptoms, and while I yet had some doubts whether Farcy would not be developed, a round, deep seated nodule, an inch and a half in diameter, made its appearance on the near quarter, over the external gluteal muscle; it was unmistakably a farcy "bud." As a change of medicine, I then gave Arsenious Acid in from

five to seven grain doses twice daily, but no further symptoms of the kind appeared, and the "bud" gradually became absorbed. With the improvement in the state of the blood, and the absorption of the petechiæ, general restoration to health commenced; the cough ceased, respiration became tranquil, the appetite was regained, and the healthy gloss of coat and roundness of body returned. The patient was sufficiently well on the 10th of May to take several hours' walking exercise, showing no trace of illness except the numerous little black scars on the thighs and arms. He has since quite recovered his health and condition.

I have endeavoured to give an accurate description of the squamous-like eruption, lest any one should hastily conclude, from the appearance of enlargements, followed by circular sores, that it was Farcy. It clearly was not. The raised skin was as dissimilar to a lymphatic tumour as it could possibly be, and there was nothing like an ulcer; though how far the peculiarity may have been determined by a taint of the above malady in the system is matter for conjecture.

It can hardly be reconciled with Anthrax, for though I am unable to describe that affection from personal observation, except as seen in the mouth and tongue, the account given of the characters of Anthracoid pustules in Fleming's "Sanitary Science and Police" differs widely from what I observed in the case related.

The crusts themselves closely resembled those of Horse Pox, as described in the same masterly work; but there was no resemblance in any other feature, notwithstanding the state of the heels.

It was, I believe, a development of Purpura Hæmorrhagica, probably similar to that described as *P. urticans*, the diseased blood which had accumulated in the spots affected gradually causing loss of vitality in the portions of skin in and beneath which they were imbedded, and which were eliminated in a dried form with the crusts.

SURGICAL AND PATHOLOGICAL NOTES.

BY J. WOODROFFE HILL, F.R.C.V.S., WOLVERHAMPTON.

Fracture of the lower jaw (Foal).

May 17th.—I visited a foal eight weeks old, the property of C. Boycott Wight, Esq., relative to an injury sustained from a supposed kick by the mother. I found the little patient suffering from a fracture of the lower jaw at the symphysis. The anterior portion was easily movable, laterally to the right or left, and crepitus was distinct. Owing to the swollen condition at the seat of injury, I ordered hot fomentations. The swelling by the 19th was sufficiently reduced to admit of the fractured parts being supported and retained in position. The means I adopted were as follows :—A stout piece of gutta-percha was steeped in warm water until softened, and then moulded to the jaw underneath and along each side until set; the necessary shape of the splint being retained, it was smeared with pitch and fixed on. After its application the animal sucked without difficulty. On the seventh day part of the gutta-percha was cut away to allow the escape of the discharge, which, owing to suppuration, issued from under the chin. In three days afterwards the skin broke on the opposite side, necessitating the removal of another portion of gutta-percha. The following week the whole splint was removed, and the wounds fomented, the jaw being then immovable.

June 14th.—Beyond a little thickening at the seat of fracture and fullness of the submaxillary glands, the animal is quite well and thriving. No exfoliation of bone, as feared, has taken place.

Disease of the heart (Pony).

May 20th.—During a professional visit to C. Boycott Wight, Esq., my attention was called to the body of a pony belonging to a laundry-woman. A few minutes after leaving the house in a small cart with the linen, it fell down dead in the drive. The boy in charge being in great distress about it, I made a *post-mortem* examination, which revealed the heart to be diseased. That organ was much enlarged and hypertrophied; there were numerous ecchymosed spots on its external surface. On opening it both ventricles were found to be empty; but in the left one, im-

mediately below the valve, and underneath the serous membrane, there was a solid, deep-red glistening body nearly the size of a hen's egg, consisting of a large blood clot, and which, from the extent to which it protruded, must have interfered with the action of the valve. A similar but much smaller one was found near it. The animal, supposed to be fully thirty years old, had been driven seven miles, apparently on an empty stomach; the latter was now gorged with the food it had partaken of in Mr. Wight's stables. Probably its being overpaced in an exhausted condition, and with a feeble heart, may have given rise to the sub-serous exudation of blood in the ventricles. The intestines were all empty.

Agalactia and Parturient Fever (Bitch).

May 21st.—I visited a bitch (Dandy Dinmont) the property of the Earl of Dartmouth; she had three days previously given birth to five mongrel whelps. No enlargement of the mammary glands had taken place during pregnancy nor after parturition, and there was not the least secretion of milk; the teats had a shrunken appearance, and the abdomen was cold. The animal was excessively weak, having to be carried out of her basket to me. The eyes though sunken were unusually bright, nose hot and dry, visible mucous membranes injected; the body was more or less œdematous, the region of the throat being very much swollen; pulse feeble and fluttering, respiration very weak. In fact the patient presented a more dead than alive appearance. I prescribed brandy and milk every hour. She died in the early morning. A *post-mortem* examination revealed congested lungs, peritoneum, and uterus. Although only dead a few hours the body had become discoloured, and emitted an offensive smell. The bitch was about three years old, and as far as could be ascertained had not had previous whelps.

Urticaria Febrilis—Nettle-rash (Bitch).

May 21st.—I examined a fox terrier bitch, the property of C. Boycott Wight, as to skin disease, and found the patient suffering from well marked *urticaria febrilis.* The surface of the body was lumpy and whealed, the face swollen, and the abdominal surface and skin on the inside of the thighs and forearms covered

with elevated red patches. The bitch was dull and feverish. I prescribed an aperient, and afterwards Spts. Ammon., Arom., and Tinct. Ferri. She was convalescent in four days.

June 11th.—The rash has appeared again. She is being treated as before. Stimulating diet prohibited.

Mania Puerperalis (*Cow*).

May 23rd.—In the evening I was requested to attend at J. C. Major's, Esq., to examine a cow which had that day shown peculiar symptoms of illness. She had calved fourteen days previously. On my arrival I found the animal, a large short-horn, in the following condition:—Eyes wild and bloodshot; pulse accelerated; respiration short and heaving at the flank; secretion of milk diminished. On walking her out of the box she staggered about in such an extraordinary manner that I deemed it advisable to get her in again as quickly as possible. I prescribed a diffusible stimulant—Ether and Arom. Spts. Ammon., and a warm mash. The calf had already been removed, as no affection was displayed for it.

24th.—Better. Pulse 48; eyes more natural; staggering gone, but agitation still manifest. The bowels being confined, I ordered a pound of sulphate of magnesia. Milk no more abundant, and appetite impaired.

25th.—I was called at night, and found the patient lying. On urging her to stand she was only able to raise her hind quarters; after a little time we got her up, when she reeled about as on my first visit. Eyes exceedingly wild and bloodshot; head continually tremulous; pulse 60 and hard; muzzle dry and hot; respiration hurried. I opened the jugular vein, but was only able, though I enlarged the orifice with a lancet, to get barely one and a half pint of black tarry blood, which immediately coagulated. Administered half a pint of brandy in water, and, the bowels being still constipated, ordered another pound of sulphate of magnesia. The cow to be watched during the night. She had eaten but little. Diet, mashes and gruel.

26th.—Brain symptoms have disappeared; pulse and breathing normal; bowels relaxed. Prescribed Ether and Arom. Spts. Ammon. every four hours in gruel or linseed tea.

6 *p.m.*—Visited her again. Was informed by the bailiff she had been considerably worse during the day, the paroxysms coming on very severely towards 4 o'clock. She was now, however, again herself. Milk still sparingly secreted, and having a greenish tint. Appetite no better.

27*th.*—Fetched at 6 a.m., and was informed she had been furious; and with the head thrown back against the right shoulder she had turned round and round like a top for two hours without cessation. I found her looking heavy about the eyes and drowsy; pulse 48; extremities warm; milk more palpably green. I now tried the calf with her, and for a time she seemed more contented. Diffusible stimulants continued, with the addition of tincture of iron.

Visited her again in the evening. She had been again much worse during the day, especially towards 4 o'clock, at which time the bailiff informed me she always had bad turns; but she was now again easy. Constipation being present, I ordered half a pint of castor oil on a pint of warm water; medicine as usual. Calf allowed to visit her.

28*th.*—No bad symptoms had again been presented; appetite returned, and the animal looking out for solid food; compelled to remove her bedding, as she was eating it. Tonics prescribed and gradual return to usual food.

29*th.*—Convalescent.

June 9*th.*—The bailiff informs me she has since occasionally shown drowsy symptoms, but feeds well, and in all other respects appears to be healthy.

Editorial.

THE MODE OF TRANSMISSION OF BOVINE CONTAGIOUS PLEURO-PNEUMONIA, AND THE VALUE OF PROTECTIVE INOCULATION.

The fact that the contagious Pleuro-pneumonia of bovines still prevails extensively in this country, and is not likely to be extinguished for a long time—if ever—should the present measures alone remain in force, is a sufficient reason for so frequently alluding to it, and keeping our readers well posted up with regard to it.

The experiments at the Brown Institution, the account of which now appears in this Journal, throw but little, if any, light upon obscure points

in the pathology of the malady; and with regard to its mode of transmission, we fear they are little else than misleading. The value of experimentation no one can deny, and when it furnishes positive results, and especially when these are in harmony with clinical observation, then is its value very great. But when experimentation only yields negative results, and clinical experience points to positive conclusions, and more particularly when negative experiments are suspected to be so, either from insufficiency in number, an absence of care in devising them, or inattention to the conditions upon which success depends, then it does not deserve much confidence. In the first volume of the VETERINARY JOURNAL (p. 415), we went carefully into the question as to whether zymotic Pleuro-pneumonia is conveyed solely by the breath of the living animal or in other ways, and we were forced to the conclusion, from the clinical facts before us, that the breath of the diseased ox was *not the only mode* of transmission. That conclusion has certainly not been weakened, but rather strengthened, since that time; inasmuch as it has been fortified by a host of trustworthy and unprejudiced observers, not only on the continent of Europe, but also in this country—as will be seen by referring to Professor Walley's praiseworthy treatise: "The Four Bovine Scourges." The notion that the contagium could only be conveyed by the breath was, we believe, founded on one or two imperfect experiments by those who appear to have been but little acquainted with the nature of the disease, or of what had been ascertained with regard to it by scientific investigators, and whose knowledge of contagious disorders in general, and their mode of dissemination in particular, was rather vague.

One of the objects aimed at in the experiments carried on at the Brown Institution on behalf of the Royal Agricultural Society, was "to ascertain, by experiment, by what different ways a healthy animal can be infected." In this experiment the example of the promulgators of the "breath theory" was followed—though differing from it, in that the animals which are not susceptible to infection were not included; in this respect there was a departure. "The lungs of animals which had been slaughtered in an advanced state of the disease were placed, in the fresh state, under the noses of ten healthy animals of all ages. As none were infected (the details of the experiments are of the most meagre description, and no mention is made of the period during which the cows were under observation), it did not seem "necessary to repeat" the trials in a systematic manner, the more so as the persons who attended on the animals were in the habit of handling the diseased organs, which were at that time frequently brought to the Institution for pathological examination." The confession is here made that the experiments were not made in a systematic manner; and this alone is sufficient to condemn the dangerous conclusion arrived at. If it had been remembered that experiments at the same institution with regard to the transmissibility of Foot-and-mouth disease, had also at one time yielded negative results, and afterwards were successful, surely a systematic investigation would have been deemed necessary! As it is, though we willingly give Dr. Burdon Sanderson every credit for his labours in elucidating this and

some other diseases of animals, we cannot help thinking that the experiments just alluded to are most untrustworthy, so far as the deduction evidently made from them is concerned. Why were not such experiments conducted in a systematic manner? Nothing can be more important in our dealings with destructive contagious diseases, such as that now under consideration, than an exact knowledge of the manner in which they can be spread. The diseased lungs of dead animals were not, one would imagine, the most likely agents to infect—at least they are not usually the media by which infection is supposed to be conveyed. Why were the ten animals which are reported to have proved refractory to the influence of these lungs and tainted attendants, not exposed to infection by the various other ways in which the malady is universally recognised to be conveyed? Could they not have been kept in the same shed with a diseased cow, or put into a place where the scourge had prevailed? Might they not have been fed on food soiled by sick oxen, and, in fact, systematically tested in every way, and for a reasonable period? And, even then, had they still remained uninfected, would it have been unreservedly accepted by those who know the malady so well that the disorder is not communicable except through the breath?

In warning agriculturists and the veterinary profession against receiving with implicit confidence the conclusion arrived at in this report, we have no intention whatever to reflect upon the ability or good faith of the reporter, but simply to point out that the experiments do not fulfil all the demands of pathological investigation, and are consequently incomplete and unreliable. In the article in the VETERINARY JOURNAL above mentioned, we said:—"Those who are accustomed to experiment, know that even with very contagious maladies every animal exposed to the contagion will not receive it; and when we know that only from thirty-five to sixty-eight per cent. of healthy cattle become diseased when the contagion is introduced among them, we can easily understand the futility, or it may be the danger, of attempting to arrive at conclusions from experiments on a very few animals.

To this opinion we have now all the more reason to adhere, from the report of the experiments at the Brown Institution; though, at the same time, we are quite ready to believe that this serious disorder can only be conveyed by the breath of the sick animal, when we are furnished with evidence sufficient in quantity and quality to outweigh that of the clinical observers who maintain the opposite opinion.

With regard to the protection afforded by inoculation, there cannot now be any reasonable doubt, except with those whose unvarying prejudice to the operation renders them incapable of acknowledging the power of stubborn facts. The French Commission, appointed so long ago as 1851, reported in its favour; and it has more or less met with the approval of the highest veterinary authorities on the Continent of Europe, some Governments—as that of Holland—making it compulsory when an outbreak of Pleuro-pneumonia occurs: so confident are they in its efficacy. In Australia and South Africa, where it only too often has been performed in the rudest and most haphazard manner, its results have been also most striking. But in this country it has not gained

much favour. Soon after its advantages were demonstrated by Dr. Willems, of Hasselt, who introduced it to notice, the Royal Agricultural Society of England, well aware of the terrible havoc the disease was making in these islands, sent the Cattle Pathology Lecturer of the Royal Veterinary College to Belgium, to report on the operation and its results. Veterinary Pathology and pathological anatomy were in those days, so far as England was concerned, in a very rudimentary condition indeed; consequently, the report was unfavourable to inoculation as a protective measure, and it never had a fair trial. The evil results of the operation were ascribed to *Septikæmia*, and its good effects were altogether denied. This condemnation has been persistently maintained by those who first published it, and by some others who have not given their attention or who did not understand the requirements of successful inoculation, closely to it, nor yet are sufficiently acquainted with pathology to perceive that inoculation really gives rise to special infective processes, very different indeed from *Septikæmia*.

Notwithstanding the strong prejudice against it by those who were supposed to be high authorities, inoculation has not been quite lost sight of in this country; and among unsuccessful attempts, apparently due to ignorance of the when, where, and how to operate, must be recorded others which yielded most satisfactory results in England, Scotland and Ireland. It is indeed strange that no attempt was made by those who should do these things, to institute a systematic inquiry into the value of inoculation, and the morbid process it produces. It is probable that had the Royal Agricultural Society been aware of what was going on abroad, it would long ago have appointed a committee of unbiassed investigators to make inquiries and experiments. In the report which we are now referring to, Dr. Burdon Sanderson, while giving inoculation some credit as a protective or preventive measure—from the evidence of the French and Australian reports—yet alludes to the risks attending it, as ordinarily performed, as too serious to admit of its adoption. He, therefore, while attempting to prove whether it was really of value, has also endeavoured to obviate these risks by the intra-venous injection of the virus. For the results we refer our readers to his report; but we may note that the idea of introducing the virus directly into the circulation, and so procuring immunity, is probably due to Chauveau's interesting experiments with vaccine virus. We may also remark that the intra-venous injection of pleuro-pneumonic virus is far from being an easy operation, and is very much more likely to be attended with serious results than another which we shall notice presently. Besides, the number of experiments is far too small, and altogether too unsatisfactory and inconclusive, to deserve anything more at present than passing comment. There are several points in the report to which strong exception can be taken on grounds of general pathology, but we forbear to extend our remarks beyond the subject of Pleuro-pneumonia.

One of the great objections offered by the opponents of inoculation is, that because it does not produce Pleuro-pneumonia, therefore it cannot prevent it. But they evidently forget that vaccination does not

produce small-pox ; and yet we know that when carefully performed it protects the vaccinated individual from that disease. Because inoculation does not give rise to the lung disorder, we cannot assert that it will not prevent the disorder. Years ago we pointed out in the clearest manner possible that inoculation with carefully selected virus did not produce *Septikæmia*, but a peculiar specific infective process in and around the seat of operation, which no other virus we were acquainted with could occasion; and that this process, in its pathological characteristics, much resembled that taking place in the lungs of oxen infected in a natural manner. To this opinion we still more firmly adhere, as a result of recent inquiry and observation, especially in Edinburgh, where Mr. Rutherford's highly successful, intelligent, and scientific practice of inoculation on a larger scale than has perhaps ever before been attempted in this country, leaves nothing more to be desired in the way of evidence as to the absolute immunity conferred by inoculation. For nearly forty years Edinburgh has been more severely scourged by the malady than, perhaps, any other part of the three kingdoms. Previous attempts at inoculation had been attended with such fatal consequences, that even those dairy keepers who were brought to the verge of ruin by the disease, preferred it to the risks of inoculation; and the strongest antagonists of the operation, we think, were to be found there. Now, they are its staunchest advocates, and if the most convincing evidence in favour of this measure is to be sought for, it will undoubtedly be found among these people. No animal inoculated by Mr. Rutherford has ever been known, no matter how much it may have subsequently been exposed to infection, to become diseased, and the dairymen have no fear whatever in introducing suspected or sick animals among those inoculated. So carefully and skilfully is the operation performed and its immediate results watched, that the mortality is diminished to one per cent., an average which will in all probability be still further reduced, and which certainly is infinitely smaller than that following intra-venous injection. An examination of Mr. Rutherford's work unmistakably demonstrates that inoculation, to be successful, demands as much skill, and even more precaution, at the hands of the inoculator, than does vaccination from the vaccinator; and that the animal operated upon, after a fixed period of some days, exhibits specific local symptoms followed by a peculiar systemic condition which lasts for some days, and is evidence of constitutional infection—a condition the existence of which has been denied by the opponents of inoculation. There is reason to believe that the action of the inoculated virus is limited to the bovine species, and will not produce either local or general disturbance when introduced beneath the skin of other species—at least, it has not affected persons who have been accidentally inoculated. This will be an interesting point to investigate, and one that can easily be decided. If it is settled in the affirmative, then it will rather invalidate one of the principal arguments advanced by Dr. Sanderson against the specific effect of inoculation.

From the evidence and opinions we have furnished years ago, it will be seen that we were then altogether in favour of protective inoculation;

but our efforts did not avail to popularise the measure. We again urge the members of the profession and agriculturists to give their attention to it. The question as to its efficacy and safety is now beyond discussion or dispute; thanks to Mr. Rutherford, the problem is solved, and the freedom of Edinburgh from Pleuro-pneumonia at the present time—a condition which has not been known to exist for more than thirty years—is mainly, if not altogether, due to his scientific skill, indomitable perseverance, and intelligent enthusiasm. For his services in this matter he has strong claims upon the Veterinary profession, inasmuch as he is, we believe, the first Veterinarian in Europe who has demonstrated that inoculation is a positive, and almost inexpensive protection against the most serious disease affecting cattle. The agricultural public are certainly heavily indebted to him for his services on their behalf, and we commend his labours to the notice of the various agricultural societies. He has been the first veterinary surgeon in this country to show that inoculation is as certain and safe in its object as vaccination, and that it confers as great a boon on bovines as the last-named operation does on mankind. He has incontestibly proved that inoculation can always put an end to an outbreak, and protect from one. His very extensive inoculations have settled, as well as raised, several interesting points in connection with Pleuro-pneumonia, to which we regret we cannot now refer.

The subject has for so long been to us of such importance, that it affords us very much gratification to be able to refer our readers to Mr. Rutherford's paper on inoculation, which appeared in our pages not long ago, and to the following replies to some questions we addressed to him in May, after making personal inquiry into inoculation as practised by him in Edinburgh, while in that city in April last. At an early date we purpose giving some particulars with regard to inoculation on the Continent.

10, BREAD STREET, EDINBURGH, *June 3rd, 1879.*

DEAR SIR,—I have much pleasure in subjoining the following answers to the queries addressed to me in your letter of May 28th.

1st. "Have any of my inoculated animals yet become affected with Pleuro-pneumonia?"—*None.*

I write from a large experience (having inoculated in and around Edinburgh over 2,000 cows), and have no hesitation in expressing my conviction that if an animal is properly inoculated, being at the time of inoculation free from Pleuro-Pneumonia, that animal immediately becomes protected, and will not contract the disease. Hence it is that, given an outbreak occurring, immediate slaughter of the affected and inoculation of the others, results in the outbreak always being arrested within a period of three weeks; the three weeks being ample time for the disease showing itself, should it so have happened that any of these inoculated were at the time of inoculation affected.

In further reply to the query, I would remark that it may be said that perhaps these cows have not been exposed to infection. Well, they nearly all have. All my work has been in badly infected byres; places where, from experience, we know the contagium had lived for an indefinite period of months, or even years, and there the cows also had been exposed to infection from newly bought animals standing under the same roof, and which, not being inoculated, became the subjects of the disease.

Over and over again, I have met with instances in which the disease has carried off uninoculated stock from amidst my inoculated, and never in a single instance has inoculation failed to give immunity.

2nd. "Have I tried inoculation on any other animals than those of the bovine species?"—I have not; but I can affirm that the lymph has no effect whatever on man.

3rd. "Will animals once inoculated successfully take the inoculation a second time as markedly as the first?"—They will not. Perfect inoculation does not admit of re-inoculation, any more than attempting to inoculate an animal that has had Pleuro-pneumonia, or is recovering from it—is always followed by no result whatever.

I would like to mention here that we get inoculation fairly shown even in cattle which are the subject of Pleuro-pneumonia, but only under certain conditions; these being where the exudative stage has not progressed too far, or where it has not fairly set in. At least, I think I have come across such cases occasionally. In cases in which the exudation has fairly commenced, inoculation only hastens a fatal termination to the disease.

4th. "What is now my average mortality?"—One per cent.

In my paper read before the members of the Scottish Metropolitan Veterinary Medical Association lately, I stated that I hoped to be able to reduce it to the above, and I have, so far as the season has gone, succeeded in doing so. I would remark that at least half of the above percentage was preventable, the casualties arising through violation of my instructions. I have inoculated this season more than 400 (all dismissed from my care), with only four casualties, and none of the four were of the ordinary kind, *i.e.*, the inoculative inflammation spreading to the root of the tail, and thence to the anus and urino-genital organs, but from paralysis, the result of exposure to draughts of cold air.

CONTAGIOUS PLEURO-PNEUMONIA IN AMERICA.

[A proof of the following article, from the pen of Professor Law, of the Cornell University, and which is to appear in the *National Live Stock Journal*, has been forwarded to us for publication as additional evidence of the presence of Contagious Pleuro-pneumonia in the United States.]

WITH some writers among us there appears to be a peculiar and inexplicable dread connected with this disease. If this were a genuine dread of the disease itself, accompanied by an earnest desire to rid the country of it at all hazards, it would be laudable. But it is not really the disease which is dreaded, so much as the knowledge on the part of our customers of the presence of the plague in our midst. The plague itself! why that is an exceedingly small matter. We know that that existed in Massachusetts in 1858 and 1860, and was killed out by the energetic action of that State, at a cost of $68,000. We know that since that time it has been repeatedly carried from New York City into Connecticut, where it has been again and again extirpated by the action of the State Commissioners. We know that the Massachusetts Board of Cattle Commissioners visited the SKILLMAN stables, Brooklyn, in 1862, and "found some sick with the acute disease"; and killed one in the last stage of the illness, the examination of which "showed a typical case of the same malady which existed in Massachusetts." We know that the Commissioners reported that

If New York, New Jersey, and Pennsylvania would adopt similar measures to those in this State (Massachusetts), it would be one of the most effective modes of securing the whole community against this disease, which, if allowed to remain, would endanger the best stock in the country, and greatly deteriorate the most substantial food of the people.

We know that the importation of the plague into Massachusetts in 1858 was made in the persons of the Holstein cows imported by Mr. CHENERY, of Belmont. We know, further, that the first importation into Brooklyn, in 1843, was by a Dutch cow landed near South Ferry and taken into a stable near the foot of Joralemon Street. Many still live who can relate all the circumstances of the boasted milking qualities of the imported cow; of her early death; of the infection of the herd with which she had stood; of the extension of the disease to a distillery stable across the street, and thence, by the sale of cows, all over Brooklyn. From that time to the present, it has prevailed constantly in Brooklyn, having been kept up by the continual changes among dairy stock, and by the mingling of different herds in summer, on the open commons around the city. The ancestry of this disease, in Brooklyn, can be as satisfactorily traced as that of any family in the English peerage, or that of any crowned house of Europe. The Yankee is no more surely the descendant of the original Puritan than is the lung plague of Brooklyn the descendant of the *Lungenseuche* of Germany.

But this is not what troubles us. The pestilence may devastate the stables of the New York and Long Island dairies at its own sweet will; it may spread over the State of New Jersey until the inspectors allege that in many counties no less than 20 per cent. are infected; it may ravage Eastern Pennsylvania, Delaware, Maryland, and Virginia, and may invade the District of Columbia itself—all this and much more may befall us; we may remain month after month, and year after year, in the most imminent danger of having the affection carried out to our Western plains, whence we could never eradicate it—this concerns us but little; but that England should for a moment suppose that we harbour such a disease, is a scandal and an outrage, and must be repudiated and denied with all possible vehemence. Our own veterinarians, who have studied the disease both here and in Europe, and who have acquainted themselves with its history on both continents, are to be silenced, that we may listen complacently to those who sit composedly at a respectful distance—at Toronto (Canada) and Edinburgh (Scotland)—and without personal examination of history, progress, symptoms, or lesions, pronounce oracularly that we "are not dealing with the contagious Pleuro-pneumonia of Europe." This action is altogether too much like that of the hunted ostrich, which buries her head in the sand in the vain hope of warding off her last-advancing fate.

I still cling to the hope that this plague has not penetrated the West—a hope supported by the entire absence of any contagious lung disease in Western cattle stopped fifty miles west of New York, as also by their constant soundness on their arrival at our Eastern stock yards, and until they have been long enough there to develop the disease. But I do not contradict the conclusions of Professors BROWN and DUGUID, and of the Principals of the Edinburgh and Glasgow Veterinary Colleges, when they state that they found contagious Pleuro-pneumonia among imported American stock. It is time enough to pronounce upon a disease when one has personally investigated it. Any reasonable man will admit that it is not impossible that there may be one or several centres of the lung plague in our Western States, or in Canada, whence some of the exported cattle were drawn. With the disease existing on our Eastern sea-board for thirty-six years, and affecting at different times, to my certain knowledge, high-class herds from which cattle were likely to be drafted for transport westward, it seems almost miraculous that it should not sooner have gained the Western States and spread widely. But besides this, there are various ways by which the "Ontario" cattle may have been infected. We have no assurance that this disease does not exist in Canada. A few years ago the *aphthous fever*, incomparably less insidious and less dangerous than the lung plague, was

exported from Great Britain to Canada, whence it spread widely over New York and New England. The importation and secret existence of the lung fever is a thousand-fold more probable.

But these are not the only possible channels for infection of the exported cattle. Who can assure us that infected cattle never entered the stock yards at Portland, Me.? Since the commencement of our work in New York, we have had cattle sent to Maine under *permit*. Did such an occurrence never take place before, and without any professional vigilance or control? Again, who can assure us that the "Ontario" never on any previous occasion carried cattle from any other port which infection was likely to reach? Who can demonstrate that the barge that carried the cattle to the Ontario had not become similarly infected? Who can certify that neither of these vessels ever carried infected hides or other animal products to or from England, or elsewhere? Who can tell whether the cars used for the transport of the cattle had ever carried infected cattle or hides? Who can deny that the attendants on these cattle in transit may have carried infection in their clothes?

Many American writers seem to lose sight of the fact that if it were established that the cattle on board the Ontario and Brazilian suffered from lung fever, it is far from being proved that this disease exists in our Western States. It would be ample ground, it is true, for a searching investigation through our Western herds, but no proof at all that these herds were really infected. But to return to the infected districts in the East. Any one who will consider for a moment, must see that the opinions of Professors WILLIAMS and SMITH, as to the nature of a disease they have never seen, and the descriptions of which have come to them only through newspaper paragraphs, are not worth the paper they are written upon. It must be evident to all, that men who will found their opinions on such a slender basis are very unfit objects of public confidence. Seeing Prof. SMITH is no further off than Toronto, and that he is so deeply interested in this disease, why did he not come to New York in person and satisfy himself as to the true nature of the malady, rather than hug his ignorance and publish an implied censure on the veterinary authority of New York, whose ability I do not for a moment believe that he doubts. By paying attention to what has been already published by the New York authorities, he could have ascertained the truth; but he has chosen to persistently shut his eyes and call for an experimental transmission of the disease by cohabitation, as if that were not seen and demonstrated every day, and on a larger scale, a thousand-fold, than could be done in a few experimental animals under the eye of an expert. For the sake of men who persistently avoid the light, I would never have lifted my pen, but for the sake of the many readers of the Journal who might otherwise be misled, I shall furnish a few examples illustrative of our daily experience with this disease.

Contagion from Cohabitation.

1*st*. By way of connecting the disease of to-day with that of 1843, I shall adduce an illustrative case, which began thirty years ago and continued for twenty years. In 1849, WM. MEAKIM, of Bushwick, L. I., kept a large dairy, and employed a man with a yoke of oxen in drawing grains from the New York and Brooklyn distilleries. A milkman on the way, who had lung fever in his herd, persuaded the man to use his oxen in drawing a dead cow out of his stable. Soon after, the oxen sickened and died; and the disease extending to his dairy cows, Mr. MEAKIM lost forty head in the short space of three months. The stables having thus become infected, Mr. M. continued to lose from six to ten cows yearly for the succeeding twenty years, or as long as he kept in the milk business. This brings the record down to 1869. It will be observed that this was the first occurrence of any such sickness in

Mr. MEAKIM'S herd; it commenced, not in the cows cooped up in hot buildings and heavily fed on swill, but in the oxen that were almost constantly in the open air, but which had been brought in contact with a dead and infecting cow; the infection of the cows followed, and for twenty long years no fresh cow could be brought into these stables with impunity.

2nd. The next case affords a most instructive contrast to the first, as showing how the disease which has been introduced into a place may be permanently eradicated by proper seclusion. In 1872, FRANK DEVINE, of Old Farm House Hotel, West Chester, purchased from a dealer a cow, which soon sickened and died. The disease extended to the rest of his herd, and in seven months he lost thirty-six cows. He appreciated the danger of contagion, and began again with new stock, keeping them rigidly apart from the infected beasts and premises, and from that time onward avoided all dealers and bred his own stock, with the happy result that in the last six years he has not had a single case of lung fever in his herd.

3rd. Twenty years ago, Mr. BENJAMIN ALBERTSON, Queens, Queens Co., L. I., purchased four cows out of a Herkimer County herd which had got belated and had been kept over night in a stable in Sixth Street, New York, where the cattle market then was. These cows sickened with lung fever, and infected his large herd of 100 head, 25 of which died in rapid succession, and 19 more slowly. He was left with but 60 head out of a herd, after purchase of the four, of 104 animals, and honorably declined to sell the survivors at high prices to his unsuspecting neighbours, but sold a number at half price to a Brooklyn milkman, who already had the disease in his herd, and knew all the circumstances.

4th. In the course of last year (1878), HENRY POST, Wheatley, Old Westbury, Queens Co., L. I., bought a cow out of a passing herd that had been brought by LEVY, a dealer, from Brooklyn stables. She infected his whole herd and his brother's to such an extent that they had to slaughter both herds, and, after a time, begin anew with fresh stock. From that time, as before, they have kept sound.

5th. Mrs. MURPHY, Brooklyn, last year bought a cow from MCCABE, a New York dealer, which infected all of her herd, so that she had to slaughter the whole and has given up the milk business.

6th. In January, 1879, Mr. JUDSON, Watertown, Conn. (and Park Hotel, New York), bought two cows of HECHT, a New York dealer. They took ill soon after, and infected his original herd of ten. All were placed in quarantine by the Connecticut authorities, but were smuggled off by HECHT (who had purchased them at a ridiculously low figure), and shipped to New York, where they were slaughtered by order of the authorities.

7th. Mrs. KELLY, Hazleton, Jamaica, L. I., bought a cow from a Williamsburgh dealer named BROWN, in the latter part of 1878. This cow sickened and died, and fatally infected the remaining three cows of her herd, so that she is now without any, and has resigned the milk business.

8th. Mr. W., Roslyn, L. I., late in 1878, bought two cows from a New York dealer. They sickened soon after, infected the rest of his herd, and six were lost before the plague could be stayed.

9th. Mr. K., Roslyn, was so satisfied it was not the lung fever that he purchased two of Mr. W.'s cows. One of these sickened and died, and infected several others of his herd, one of which had to be destroyed by order of the State authorities.

10th. Mr. M., Katonah, Westchester Co., in July, 1878, took in a Jersey cow sent from Motthaven as a present to his son-in-law. Three months later, his herd was generally infected, and the Jersey cow and two others died.

11th. The herd of M.'s sister-in-law, Mrs. R., which was kept across the

street, sickened in October, and, up to the time of my visit, early in March, five out of twelve had died.

12th. Mr. COLLINS, of 50th Street, New York, had a Jersey cow which suffered, in August, 1878, from some disease of the lungs that was denied to be the lung fever by the veterinarian who attended her. On September 20th her calf was sent to SOLOMON MEAD, Greenwich, Conn., who had agreed to keep it two years. The calf died two weeks after arrival, and infected ten of his herd; five of which had died, and five were recovering, at the period of my visit (March 21st). The herd at that time numbered 13.

13th. Mr. GRIFFIN, Greenwich, Conn., occupied a farm alongside Mr. MEAD'S, and had his herd infected by a cow which broke out of MEAD'S herd and got, for a very short time, into his (GRIFFIN'S). At the time of my visit, Mr. G. had lost one, and had two in course of apparent recovery. As he was just over the Connecticut line, and out of the jurisdiction of New York, the sick had to be left, and the result has been that a number of his remaining herd of 26 have been infected since, and several have died.

14th. Mr. C., 146th Street, New York, had a cow sent on trial, last February, by GEISSMANN, a Yorkville dealer. She stood but one night in his stables; was removed next day, because she looked bad, and another cow sent in her place. The last named cow still survives; but three out of the five remaining cows contracted the lung fever, and when slaughtered by the State authorities, May 12th, showed most extensive disease of the lungs.

15th. Mr. T., 114th Street, New York, purchased a cow of KRAMER, a New York dealer, early in October, 1878. She took ill, and finally died, in February, 1879. At the time of our visit, May 14th, two other of his cows were suffering from the lung plague in a chronic form, and their destruction had to be ordered for the protection of the herd.

16th. About January 1st, 1879, ISAAC BILLARD, dealer, of Cutchogue, L. I., took a drove of 112 calves and yearlings from a place in New York City, to which we have traced a number of outbreaks. He sent them by cars to Bridgehampton, and sold them to farmers in the towns of Southampton and Easthampton. A month ago, a floating rumour of disease in these towns reached me; but, on inquiry, its correctness was denied, and it was only recently that definite information could be obtained. May 6th to 8th, I visited these towns, in company with another member of the Veterinary Sanitary Staff, and condemned and ordered sixteen head, out of six herds into which calves of the Billard drove had been taken, to be slaughtered. Taking the first herd visited as an illustrative case: I. W., of Sagg, bought of BILLARD one bull calf, which sickened soon after, but apparently recovered, or, rather, as is too often the case, the disease subsided into a chronic form. This strange calf infected 13 more of his herd, five of which had died before our arrival, while nine, including the bull calf, were destroyed, and paid for by the State. In this case six of the condemned animals were supposed by their owner and his neighbours to be in good health, and it was only when they had been destroyed, and the extensive diseased changes in the lungs had been shown, that they became convinced that a serious blunder had not been committed. This is an every day experience with us, and illustrates how the disease is spread by cattle which an ordinary observer would consider to be perfectly sound.

These 16 cases of infection ought to be sufficient to convince any mind that is open to conviction that we are dealing with a disease which is eminently and most dangerously contagious. If anyone is still dissatisfied, I can add to the list to his heart's content. The reason why unobservant people fail at first to see that the lung fever is contagious, is, that the seeds of the disease lie so long dormant in the system. A beast purchased in October passes a bad winter, and dies in February, after having infected several others. She

had had a long *period of incubation*, and when the disease supervenes actively she has passed through a chronic form of the illness, so that, when others sicken people fail to connect the new cases with the infected purchase. Then again, in an ordinary herd of 10 or 20 head, the deaths do not follow in rapid succession, but at intervals of a fortnight, a month, or even more, and those unacquainted with the nature of the disease suppose that it cannot be infectious, or all would be prostrated at once.

Instances of mediate Contagion.

A. *Contagion through the Atmosphere.*—Some years ago, Professors SIMONDS and BROWN advanced the hypothesis that this disease could not be conveyed from animal to animal by *mediate contagion*, but that, in order to its transmission, the sick animal must be brought into direct contact with the healthy. It is difficult to see how such an absolute claim can be advanced in the face of the every-day observation that, when a sick animal is introduced into one end of a stable, the plague often skips many intervening ones to strike down a beast near the farthest end of the building. In such a case the air is the *medium* through which the virus is carried, and the contagion is unquestionably *mediate*.

The experiments conducted at the Brown Institution, in September, 1876, March, 1877, and August, 1878, by Dr. BURDON SANDERSON and Prof. DUGUID, in which healthy cattle were exposed to the emanations from diseased lungs without any ill result, are quoted as disproving contagion through the air. But one or several failures to convey a disease is no proof that the disease in question is not contagious. I might quote the example of the enthusiastic non-contagionists, who clothed themselves with the linen fresh from the bodies of cholera patients, lay with them in the same beds, and even drank their blood with impunity. The results did not prove that cholera was non-virulent, but only that they did not furnish the conditions necessary to induce contagion. We now know that if they had experimented with the bowel dejections of cholera patients, cholera would have been produced, in all susceptible subjects, on given days after their passage.

It seems highly probable that a flaw no less serious entered into the experiments conducted at the Brown Institution. If the emanations from the lungs of a sick animal can infect a healthy cow at the farther end of a long stable, there seems no good reason to conclude that the fresh lungs, warm from the sick beast, cannot give off emanations virulent to any susceptible animal. This question of the *susceptibility* of the healthy animals exposed is the first that suggests itself; and in the report of Dr. BURDON SANDERSON and Prof. DUGUID there is not a hint that this susceptibility had been tested. Had the animals that resisted exposure to the *diseased lungs* been afterwards infected by *contact* with *sick cattle*, the claim that the lungs could not convey the disease after their removal from the body, would have been rendered much more plausible. At present, the thousand cases of the conveyance of the virus through the air of a stable must be held as more authoritative than the three negative results from the diseased lungs at the Brown Institution.

B. *Contagion by Pulmonary Exudation introduced into the Nose.*—Prof. BALDWIN, of Glasnevin, informs me that, many years ago, he soaked a sponge in the liquid from a diseased lung and stuffed it into the nostril of a sound animal, which, in due time, showed all the symptoms of the lung fever.

C. *Contagion carried by Attendants.*—As this has been warmly debated on the other side of the Atlantic, I shall record two cases which ought of themselves to settle the question.

1st. In the winter of 1847-8, infected oxen were unwittingly purchased to

be fed on Pitcox, East Lothian, Scotland. The disease spread through the whole herd, causing most extensive losses. The cattle-man on the farm was the son of the farm steward on the neighbouring farm of Pleasants. The buildings on the two farms where the cattle were confined were about a mile and a half apart, and the Pitcox cattle-man came this distance weekly to pay a Sunday visit to his parents. On such visits he never failed to go in to see how his father's cow was doing. In the course of a few weeks the father's cow was noticed ailing, and from her the malady spread to all the cattle on the farm, entailing heavy losses on the owner.

2nd. In February, 1879, when we began the *stamping out* of the plague on Long Island, a gentleman of the name of DITMAS JEWEL took a great interest in the welfare of the suffering milkmen, and visited one or more of the worst-infected stables daily. He owned one favorite family cow, a Jersey, which was kept alone in a private stable, separated by ample grounds from all adjacent herds. She was never removed from these premises, nor were other cattle admitted, yet, towards the end of March, she sickened, and soon perished, presenting the most characteristic lung-plague lesions.

These two cases are conclusive, as in neither instance was there any possibility of *direct contact* with sick animals, while in both there was the *mediate contact* through the persons and clothes of the visitors.

D. *Contagion through the Infected Buildings.*—This form of contagion is so exceedingly common that an apology would be needed for referring to it were it not for the hardihood of some in denying all *mediate contagion.* Distillery stables, where the cattle of many owners mingle, soon become infected in infected localities, and from that time onward they remain infecting, though all sick animals are excluded. Dealers' stables suffer in a similar way; and thus, after a dealer has kept an infected animal in his place, he continues for months or years to disseminate cattle that infect others, though it may be impossible to find a sick beast on his premises at any time in the interval. One or two cases may, however, be particularized:

1st. JOHN MILLER, Farmingdale, L. I., traded with a Brooklyn dealer, January 1st, 1879, for a cow, which, soon after, fell ill and died. He shortly after purchased another cow, and placed her in the same stable, but she also sickened and died. After this, he placed a calf in the stable, but this also perished; and at present the stable remains unoccupied.

2nd. Mrs. P. G., 12th Street, Brooklyn, had two cows and one calf in her stable in the end of February, 1879. When visited, one cow was very sick, and her destruction was secured, the stable being afterwards washed with disinfectant liquids. The calf was disposed of for veal. Two months later Mrs. G. purchased a new cow from a man who had kept her as a family cow for some years, and put her in the same stable in which the first had stood. Ten days after, she showed symptoms of disease, and when slaughtered, showed the characteristic lesions of lung fever.

E. *Infection through the Manure.*—Mrs. P., Franklyn Avenue, Brooklyn, kept eight cows, and had made no purchase since the autumn of 1878. On March 26th, one of her cows was found to be affected with lung fever, and was killed in consequence. The only appreciable source of contagion was the manure, which had been drawn from infected city stables, and spread on a lot where these cows were turned out on fine days for exercise. In spite of the ploughing under the manure as soon as the frost would allow, three more of her cattle have sickened, and had to be killed May 12. As further evidence of the contagious nature of the affection in this case, Mr. K., her neighbour, who had visited and handled her first sick cow, has since lost one out of his herd of eleven, with unequivocal symptoms and lesions.

For the future I trust that we shall hear less of the scepticism as to the contagious nature of this disease. In the face of the above testimony, that stock

owner would be foolhardy indeed who would experiment on his own stock with this *contagium*. We need no experiment to establish the facts that the sun is warm, that flame burns, that snow chills, abundance of testimony is furnished to our hands. So also with the contagion of lung fever, the man who will come into a district where it prevails, and watch its progress from herd to herd, will find at every step evidence equally clear and irrefragable, without a resort to the slow, inconclusive, and dangerous method of experimental transmission by cohabitation. We no longer need any proof of contagion; but we do need a short and speedy stamping out of the disease in every locality where it has gained a footing. All measures that hinder this, whether proposals for investigation, or the impossible but delusive proposition to examine all our cattle while in transit, can but work evil, and only evil, to our live-stock interests.

JAMES LAW.

TRICHINOSIS IN SWINE.

SINCE the commencement of the VETERINARY JOURNAL, scarcely a month has passed without some reference to the parasitic disease of swine known as *Trichinosis* or *Trichiniasis*, and more especially with reference to its prevalence on the Continent. More recently, however, the existence of the disease in American swine has been alluded to, and unmistakable evidence of this fact has been furnished in the reports we published from Germany, where *trichinæ* were discovered in pork received from the United States. So long ago, also, as 1874, we devoted a section of our work on "Veterinary Sanitary Science and Police" (vol. ii., p. 482), to the subject, which is there exhaustively treated; and we mentioned that outbreaks of *Trichinosis* were far from infrequent in America—one being prevalent when the work was in course of publication. The great importance of the subject, so far as the public health is concerned, and our anxiety that some measures should be adopted to prevent people being infected in this country, mainly prompted us to give it so much notice. We were cognisant of the fact that *Trichinosis* in pigs was rapidly extending in the United States—from two per cent. in 1868 to eight per cent. in 1878 in Chicago; and also that every year the importation of live pigs, as well as their products in the shape of ham, bacon, and pork, was immensely on the increase, while no attention whatever was paid to the sanitary condition of these on their arrival in this country; so that consumers of these articles were exposed to great danger. Finding that the authorities were either ignorant, incredulous, or indifferent with regard to the existence of *trichinæ* in American pigs, we went beyond the range of this Journal, and addressed ourselves to other influential organs, to one of which—the *Lancet*, for February 22nd—we wrote the following article, which appeared as a sub-editorial:—

"TRICHINÆ IN AMERICAN PIGS.

"A FEW months ago the discovery was made in Germany that *trichinæ* existed in considerable numbers in specimens of bacon and pork, selected from some imported from the United States of America; and as a pretty large trade had sprung up in these commodities, and was rapidly on the increase, the announcement caused considerable alarm and disappointment in some of the German towns. When the intelligence reached America, it was received with real or simulated incredulity by those chiefly concerned in the rearing of pigs and the exportation of their carcases, and in more than one agricultural periodical, as well as in other journals devoted to the food export business, the truth of the statement was indignantly denied, and it was strenuously asserted that the muscle-worm was unknown in America, just as it had

been maintained on the other side of the Atlantic that contagious Pleuro-pneumonia was not present among the cattle there. And this in presence of the fact that outbreaks of *Trichinosis* had been recorded as occurring in the human species on that Continent—notably a serious manifestation of the malady in 1874,—and that, eight years previously, a committee of the Chicago Academy of Sciences had investigated the disease in the pig. These outbreaks were either ignored or overlooked in the States, and it would seem as if they were unknown in Europe, for we have never looked with any suspicion on the hams and bacon arriving in this country; while so many grave epidemics had taken place in Germany among people who had eaten the flesh of pigs infected with the entozoon, and precautions in the way of inspection and cooking had to be so carefully observed with regard to the products of the native animal, that supplies from America, which was believed did not require these troublesome observances, were hailed with satisfaction. But the fact has been clearly demonstrated, that American pork is even more infected than that of Germany, according to the statements of German investigators, and it should put us on our guard. It has been stated in this country and America that the muscle-worm does not cause any disturbance of the health of the animals whose bodies are infected with it. But this is not always so, though it is true that in some experiments, in which creatures were fed upon trichonised flesh there was no perceptible inconvenience manifested. And Atwood and Belfield fed a white rat, then three weeks old, on trichinous pork, a liberal supply of which was given from every infected sample. Nevertheless, the creature grew rapidly, and seemed to enjoy the best of health, his excellent condition being a subject of remark; yet when killed, his muscles—from the tip of the nose to the end of the tail—were literally alive with *trichinæ*, from ten to thirteen appearing in every field of the microscope. But if we refer to Fleming's 'Veterinary Sanitary Science and Police' (vol. ii., page 491, note), we shall find that the most serious symptoms, and even death, have been produced in pigs by experimental feeding with trichinous flesh. The symptoms varied, of course, with the degree of infection, but in the graver cases they were due at first to the intestinal irritation, and at a later period to the muscular inflammation. The first is denoted by the diminution or suspension of the appetite (though this is rare), vomiting, distention of the abdomen, manifestations of colic, more or less severe, and diarrhœa, which sometimes persists for weeks. There is dulness—the animals are inclined to lie a good deal and to hide themselves beneath the litter; and, if standing, the back is arched and the tail pendant. Fever is present, the pulse is quickened, the body varies in temperature, and there is great debility. The symptoms ensue towards the end of the first or commencement of the second week after ingestion of the trichinous pork, and, with the exception of the diarrhœa, they disappear after lasting from six to eight days—if death does not occur within that time, as sometimes happens with very young pigs, or those which are older and have received a very large quantity of the entozoa. Sometimes death takes place from peritonitis, consequent on perforation of the intestine by a great number of the worms simultaneously; and in other cases there is a peculiar form of enteritis with the ejection of false membranes per annum. When the muscular symptoms appear the intestinal disturbance becomes less marked, but the fever increases in intensity. The pig is often lying, and in walking it carries the back raised, and the limbs are stiff and painful; opening the mouth, mastication, and deglutition are difficult; the voice is harsh, husky, and weak; the respiration loud and laboured; cutaneous œdema appears in different parts, together with intense pruritus, and emaciation rapidly sets in. If death does not take place the symptoms gradually subside, and it is only in very debilitated animals that convalescence is slow.

We have been induced to notice these symptoms in the pig as we are not aware that they are recognised as indicative of *Trichinosis* in that animal; indeed, there is reason to believe that neither pigs nor pork are suspected of infection, and many animals may die annually of the malady without the cause being defined. There can scarcely be a doubt that the porcine race in the three kingdoms is just as likely to harbour *trichinæ* as on the Continent, or in America, though they are never looked for, or even dreamt of as being present in swine's flesh. This is a sanitary question of no mean importance, and one which should receive immediate attention; for in the country in which the *trichinæ* were first discovered in the human body, there is good foundation for believing that they are far from rare, and that people may suffer from their effects and their disease be ascribed to other causes. The resemblance of the symptoms of *Trichinosis* in human beings to those of other, but widely different, maladies, may, we think, occasion an erroneous diagnosis. If it is admitted or proved that trichinous pork is consumed as food in this country, then we can see no just cause for doubting the occurrence of the disease in man, when we know how cooking is sometimes performed, and also that in some counties, as in Yorkshire and Lancashire, the lower classes (navvies, farm-labourers, and the like) are peculiarly addicted to the consumption of raw pork. At any rate, after what we know as to the percentage of infected pigs in Chicago, and other parts of America, and the abundant supply we receive from our cousins of live and dead porkers, as well as the suspicion that our own swine may not be much freer from such troublesome and repulsive vermin, it is as well to be on the look-out, and ascertain what our risks really are."

This article was written in February last, and yet nothing was done to ascertain to what extent *Trichinosis* prevailed, either in imported or home-grown swine's flesh; and it will be seen from the Parliamentary intelligence reported in our last issue, that so late as May 8th the Government was ignorant of the existence of the disease. Who is responsible for this state of affairs we know not, but it is certainly most discreditable, and shows, in the strongest light, the miserable position of Veterinary Sanitary Science in this country. Germany, in 1877, had discovered 343 cases of trichinotic infection in imported American bacon and pork, while 138 people had been affected with *Trichinosis;* and in 1878, of 35,510 American hams inspected at Hamburg alone, 297 were infected, with 85 sides of bacon out of 14,000. *Trichinæ* had also been found in American hams carried from Liverpool to Germany; and so great was the consequent alarm that Italy, Greece, and some other countries altogether interdicted the importation of swine or their products from the United States. Surely something of all this should have been known to our Government! There cannot be a doubt that at any time during the last ten, twelve, or more years, *trichinæ* would have been discovered in American pigs brought to this country, had search been made for them; and the alarm on the Continent in recent times might, at least, have aroused suspicion.

We are not surprised that our contemporary, for June, should only now begin to learn something of the matter; though its information is derived *more especially* from "agricultural papers" of "the last few weeks." Neither are we at all astonished when it states that "the question of American pigs being the bearers of *trichinæ* remains still to be determined," as sanitary or scientific information is, unfortunately, not one of its characteristics; and its unconsciousness of very much of what has been going on for years in the domain of medical science, may largely account for the government neglect of *Trichinosis*, as well as other maladies which have caused the nation great injury, and the loss of millions of pounds. Twelve years ago, the existence of *trichinæ* in American swine was "determined," not by our experts, certainly, but by the Americans themselves; and from the

answer given by the Lord President of the Privy Council in the House of Lords, on May 29th (see Parliamentary Proceedings in this month's *Journal*), the question has at last been "determined" at Liverpool, though not by our contemporary. The incident is not at all of a novel character, for reference to the history of Veterinary Medicine in this country for the last forty years, will show that incredulity, non-determination, and unacquaintance with what we may term the science of Veterinary Medicine generally, have been predominant, and this has not only done us irreparable damage, but has made us the laughing stock of other countries.

To prove that American swine are the bearers of *trichinæ* to a far more serious extent, even, than the pigs in Germany, we have much pleasure in presenting our readers with the following report, already referred to, which we have had in type for some six months, but could not find room for, in consequence of the demands on our space. It will be seen that there is nothing more to "determine" with regard to this subject, though it would be well to "determine" the question as to whether our contemporary can lay any claim to represent the veterinary profession in such a matter. We may well experience a feeling of shame and regret that such things should still have to be commented upon, in these terms, in connection with Veterinary Sanitary Science in England—but so it is.

Last autumn, the Health Commissioner DeWolf, of Chicago, directed his attention to the question of *trichinæ* in pork, and decided to have the subject investigated, with a view, if possible, of reaching some means whereby they could be readily detected by the meat inspectors of the city, and the consumption of the flesh stopped. He accordingly addressed the following letter to the gentlemen named therein :—

"Office Health Department, Chicago, September 15th, 1878.

"Messrs. H. F. Atwood and W. F. Belfield, M.D.

"Gentlemen,—I am doing what I can, with the means at my command, to detect and consign to the rendering vats all meats exposed for sale or designed for our markets which are unfit for food. More than 200,000 pounds have thus been disposed of to date the present year.

"I am anxious regarding the question of *trichinæ* in pork, because of the peculiar difficulty of their detection by the unaided eye of our inspectors. Will it be possible for you to make for me a scientific and authoritative examination of the question whether our pork supply is affected with this parasite? or to what extent? If an examination can be made, I will see to it that the material is on hand whenever wanted; and, if *trichinæ* are found will you please favour me with a report covering the following points:

"To what extent are these parasites dangerous to health or life?

"Are trichinous animals generally out of health?

"Can reliance be placed upon thorough salting or smoking of meat as destructive of *trichinæ*?

"Are there any practical means by which our meat inspectors can detect the parasite in a carcase of meat?

"Such an account of the natural history of the parasite as will instruct the public?

"I am, gentlemen, very respectfully, your obedient servant,

"OSCAR C. DEWOLF, M.D., Commissioner of Health."

Dr. Atwood is vice-president of the State Microscopical Society, and Dr. Belfield demonstrator of anatomy in Rush Medical College and assistant pathologist of the county hospital. These gentlemen, so eminently fitted for the consideration of the subject in its microscopical and anatomical phases, undertook the task, and have been engaged upon it ever since. The result

of their work is the following interesting and instructive report, which has just been completed :—

"Oscar C. DeWolf, M.D., Commissioner of Health.

"Dear Sir,—In compliance with your request, we have made a series of careful examinations of pork with reference to *trichinæ*, and have the honour to submit the following report : The samples have been brought to us each day by Officer Lamb, of your force, to whom our thanks are due for his punctuality. He has procured specimens of pork from each of the packing and slaughtering establishments in the city, and at the stockyards. In accordance with our instructions, he took from each hog two pieces, one from the tender-loin (psoas muscle), the other from the ham. We have examined each evening samples from two and sometimes three animals, our method being as follows :—Thin longitudinal sections were cut from the muscle, and immediately transferred to the live-box, either in water, glycerine, or a mixture of water, glycerine and acetic acid. They were then examined on a Bulloch binocular instrument, with Bauch and Lamb three-quarter inch objective and A oculars, giving an amplification of about seventy-five diameters. Most of the sections were examined by each of us independently ; hence we feel reasonably confident that no *trichinæ* escaped our observation. From the one hundred hogs, we examined nineteen hundred and twenty-seven sections, or nearly twenty from each hog.

"We had intended examining upward of one thousand animals, but on account of your urgent request for an early report, and because the average of infected ones was so uniform, we have consented to give the results arrived at on the first five hundred.

"Eight of the one hundred hogs were infected, the ninth, twenty-fifth, twenty-ninth, fifty-third, fifty-fourth, sixty-third, seventy-sixth, and ninetieth hogs containing *trichinæ*. Some were badly infected, while in others comparatively few parasites were found. In all cases the hams were apparently free from *trichinæ*, those we found being always contained in the psoas muscles. In the twenty-ninth hog we found the smallest number, there being not more than thirty-five to the cubic inch, while the specimen from the ninetieth hog contained, by a careful estimate, not less than thirteen thousand in the same bulk.

"In reply to your question as to whether trichinous hogs are generally out of health, we would say that nothing in our observations or study would prompt us to answer in the affirmative. It is the normal condition of an animal to harbour one or more varieties of parasites. Van Beneden states, in his work on 'Animal Parasites and Messmates'—speaking of parasites in general : 'They are not more abundant in delicate individuals than in those who enjoy the most robust health. On the contrary, all wild animals harbour their parasitical worms, and the greater part of them have not lived long in captivity before nematode and cestode worms completely disappear.' Moreover, to satisfy ourselves and to demonstrate other facts, we commenced at an early stage in our work to feed trichinous pork to a white rat, then three weeks old. He received a liberal supply of this pabulum from every sample that we found infected. The animal grew rapidly and always enjoyed the best of health : his excellent condition being a subject of remark by visitors at our laboratory. On November 17th, we killed the animal, whose muscles were found to be literally alive with *trichinæ*, from ten to thirteen appearing in every field. Every muscle was infected from the tip of his nose to the end of his tail. This, we think, answers your question in the negative.

"You ask, 'Are there any practical means by which our meat inspectors can detect the parasite in a carcase of meat?' We would reply that the microscope is the only infallible means. To the unaided eye the infected

meat presents no peculiar appearance, unless the parasites be present in excessive numbers. The German government has for some years made a microscopic examination of pork a necessary preliminary to its exposure for sale. The parasite is not destroyed by thorough salting and smoking, as is evidenced by the fact that most of the cases of *Trichinosis* in the western country are traceable to raw smoked hams. To ascertain whether or not an infected ham could be rendered harmless, we instituted a series of experiments in the physiological laboratory of Rush Medical College. As a result of these we found that in sulphurous acid we have an agent which not only instantly kills the worms, but readily permeates the entire ham, and is as readily expelled. Owing to the cheapness of this article, the addition of a sufficient quantity of it to the pickle would add but a trifle to the expense of curing.

"In view of the results of our investigations, several important questions suggest themselves. First, why is the percentage of infected hogs so much greater than it was eight years ago? At that time a committee of the Chicago Academy of Sciences examined a large number of hogs, and found but two per cent. infected. We are unable at present to offer any satisfactory solution of this question. Second, why is the percentage of infected hogs so much greater here than in Germany? Englebrecht states (*Anleitung zur untersuchung der geschlachteten schweine auf trichinen*) that of 618,236 hogs examined between October, 1866, and April, 1873, but 70 were found to contain *trichinæ*. These examinations were made by government officials in the Duchy of Brunswick. We are unable to explain the greater prevalence of the parasite in America, but are at present conducting experiments which we hope may lead to a solution of this problem.

"The third and practically most important query is this: Since eight per cent. of our hogs are trichinous, why are cases of *Trichinosis* so rare? We would advance three propositions: First, that in most instances the meat is previously subjected to thorough cooking, whereby the worms are killed. Second, that in consequence of the close resemblance of the symptoms of *Trichinosis* to those induced by other causes, notably Typhoid Fever, is it not probable that in some instances it has been mistaken for other complaints? Third, that the ingestion of a certain number of living *trichinæ* is followed by no unpleasant results. In proof of this, we adduce the case of the white rat above described, whose carcase, weighing, when dressed, one ounce, contained not less than one hundred thousand worms. Moreover, in cases where an entire family has partaken of trichinous pork, while some members have experienced serious, perhaps even fatal, illness, others have escaped with little or no indisposition. So firm was our confidence in the harmlessness of a few *trichinæ*, that one of us (Dr. Belfield) ate, on November 20th, a portion of the rat referred to, which was demonstrated under the microscope to contain twelve living *trichinæ*. At this date no unusual symptoms have resulted from his oriental diet.

"That the prevalence of *trichinæ* in the human family is more extensive than is generally supposed, is proven by the researches of Turner, Wagner, Virchow, and others (as stated by Ziemssen). These observers found that from two to three per cent. of all bodies examined, in which there was no suspicion of the presence of the parasite, contained *trichinæ*. This, too, was in Europe, where the worm was of less frequent occurrence than in this country. Indeed, there seems to be no limit to the number of *trichinæ* that a man may sustain with impunity; for in numerous instances the bodies of patients, never suspected of having suffered from *Trichinosis*, have been found, *post mortem*, to contain enormous numbers of these worms. Doubtless, in these cases *trichinæ* were ingested at several different periods, only a comparatively small number having been swallowed on any single occasion.

"With regard to the natural history of the parasite, we would briefly state the following facts: The presence of the worm in the hog is ascribed by most authorities on the subject, to infected rats which he may have devoured. This belief we are not inclined to accept, though we are not as yet in possession of sufficient data for sustaining our theory. Wherever the parasite originates, it usually enters the human stomach encapsulated in pork.

"Its condition is then analogous to the pupa state of the insecta. The cyst consists of a connective tissue envelope enclosing mineral matter, which consists largely of phosphate and carbonate of calcium. This is not unlike an egg-shell, except that the connective tissue is external, while in the egg the integument is internal to the calcareous matter. Contact with gastric juice causes the disintegration of the cyst, the pepsin digesting the connective tissue, the free acid decomposing the calcareous salts. To ascertain the time required for this process, we procured some juice from the stomach of a dog by means of a gastric fistula. Thin sections were placed in a live box, covered with this fluid, and a temperature of 100 degrees maintained. The worms were observed to escape in from twenty to forty minutes. These worms do no other harm than the infliction of their progeny, which is effected within eight days, each female producing a brood variously estimated from 300 to 1,200. The adult parasites are soon thereafter ejected with the fæces. The young *trichina* shortly after birth forces his way through the intestinal wall and seeks the voluntary muscles, increasing in size as he progresses. Continuing his course, he passes between the muscle fibres, until, arriving at his future home, he pierces its sheath and coils himself up in the fibre. Then follow the phenomena usually occasioned by the presence of a foreign body. The irritation causes multiplication of nuclei, absorption of the formed material, with subsequent fatty, and finally calcareous, degeneration. Meanwhile, the proliferation of cells results in the formation of a connective tissue envelope. The animal is thus enclosed in a living tomb, which he never leaves, unless liberated by the gastric juice of another animal. In this condition he remains unchanged for an indefinite time, stated by certain authorities to be sometimes as much as twenty years.

"In concluding our report, it may not be amiss to emphasise the necessity of thorough cooking of pork as a preparation for the table, since the parasite is killed at a temperature far below that of boiling water. It is far from our intent and desire to be classed among the alarmists, as is evidenced by the statement of our belief in the comparative harmlessness of the parasite—an opinion at variance with that usually expressed by previous writers on the subject. These investigations have been conducted in a truly scientific spirit, and we state our results as they actually occurred."

THE HORSE-SICKNESS OF SOUTH AFRICA.

Two quantities of blood from horses dying or dead from "Horse-sickness" in Natal, have, through the kindness of the Principal Veterinary Surgeon, been recently forwarded to us for examination and experiment. The first instalment was sent by Mr. Duck, Royal Artillery, but it was much decomposed, and we could not detect any *Bacilli anthracis*, nothing except putrefaction Bacteria and swarms of Micrococci. Guinea pigs were inoculated, but without result. The second quantity was obtained from a horse at Durban, by Mr. Glover, Royal Artillery. It was a mixture of the blood with aqueous humour from sheep's eyes, but it also unfortunately was undergoing decomposition. Like the first quantity, it contained only the ordinary Bacteria of putrefaction, myriads of Micrococci, and a few non-motile, very small rod-shaped Bacteria. An extremely minute filaria was found in one of the portions examined; but this was in all probability

derived from the sheep's eyes, as it was the only specimen discovered. The results of inoculation with the blood were rather doubtful. If our friends in South Africa will kindly fill some small glass tubes with some of this blood, should they have the opportunity, and hermetically seal them at once, forwarding them at their convenience, we shall esteem it a favour. Small portions of lung containing one or more bronchules, and preserved in equal parts of alcohol and water, will also be most useful.

The horses sent from this country to Natal are reported as in excellent health and condition—only three per cent. being on the sick list; the cases of Horse-sickness appear to have been very few, and now that the winter has set in the dreaded malady should not be apprehended for some months. The following report, addressed by Dr. Atherstone to His Excellency the Lieutenant-General Commanding the forces in Natal, has been published, with a supplementary observation, in an Order issued at Pietermaritzburg, February, 1879.

"Having made many post-mortems on horses which have died from the effects of the disease commonly known as 'horse-sickness' in this colony, I consider it to be a specific fever, the result of a specific poison given off by the grass—as that of 'hay fever' is—when in certain stages of decomposition. These disease germs, when inhaled by the animal, give rise to inflammation of the lungs and heart, and prove rapidly fatal. Frost stops the disease at once; and localities of a certain elevation have been found to be safe from attack. Exposure to night air, or the still moist air of hollows, is sure to produce it. It is worst and earliest in wet weather, and in summer and spring when vegetation is rapid. Stabled horses never get it, unless their hay has been exposed to the night dew, and thus filled with disease germs; or unless they have been exposed to the night air in affected localities. During the epidemic of 1871-2 I rode with my son through the Sunday's River district, where almost every horse had died from it, in order to test the correctness of my ideas on this subject. We provided ourselves with large flannel nose-bags, and attaching them by an indiarubber band to the halter, we left our horses tied to a waggon or tree during the night, fully exposed to the effects of the night air. When the sun was up we took them off. After a fortnight's trial in places where the farmer had lost every horse he possessed from the effects of the epidemic, we returned without either of our horses having been affected. The flannel had filtered the night air, laden with the germs of disease, and our horses remained in perfect health. The best mode of treatment for horses attacked by the epidemic is to employ ammonia, and blistering with the juice of the euphorbia and boiling water, both easily procurable, with supporting diet; in fact, the same treatment as for 'typhoid pneumonia.' The Lieutenant-General Commanding, on the above testimony, considers it desirable to direct that, with a view to prevent horses suffering from the effects of night air, nosebags should be continually worn from sunset to sunrise."

We may mention that four cases of the disease have occurred in the 17th Lancers, one in the Transport, and one on the Lower Tugela. Five cases of Glanders are reported as having appeared among the Colonial Transport horses.

The Ontario transport ship recently carried 420 mules from New York to Natal, a very long voyage, and only lost eleven. They were in charge of Veterinary Surgeon Burt, Royal Artillery.

SUPPRESSION OF HÆMORRHAGE AFTER CASTRATION.

It sometimes happens that after castration of horses by the actual cautery, as well as by other means, there is more or less hæmorrhage from the

spermatic artery, no matter how skilfully or carefully the operation may have been performed; and as this hæmorrhage, if not injurious to any serious degree, is at any rate alarming to non-professional observers, it is prudent to suppress it without delay. It appears from the trial recorded in our last issue, that some members of the profession object to plugging the canal leading from the scrotum to the inguinal ring, on the score of danger, while others have not heard of this device. On several occasions we have been compelled to resort to it, and it has proved eminently successful, and never been followed by any ill effects. We have simply pushed a mass of fine tow, steeped in cold water, as high as possible up the cavity, where it was retained without any stitches in the scrotum. When this has not checked the bleeding, we have applied a folded horse-rug, saturated with cold water, across the loins for a few minutes. This acts as if by magic. The tow plug may be gently removed in an hour or two. This mode of suppressing hæmorrhage is so safe and effective that we can confidently recommend it; though we think that bleeding, and some other troublesome consequences of castration, would be obviated if the *écraseur* were alone employed for the removal of the testicle after the vas deferens and tunica reflexa are divided by sharp scissors.

THE MORTALITY AMONG CAMELS IN AFGHANISTAN.

It is an extraordinary circumstance that the land transport service of the British Army should prove such a serious subject in every war we undertake, and cause, if not the defeat of our troops, at least a world of anxiety and embarrassment, as well as prove a most costly branch of the service. In post-prandial orations we are accustomed to the assertion that our troops can go anywhere, and do anything. That they can fight as stoutly and stubbornly as the most valiant warriors of past or present times no one dare gainsay, but that they can go anywhere may well be doubted, after what has transpired in Afghanistan, and what we now witness in Zululand. The mobility of troops appears to be lost sight of, and our military authorities seem to limit their attention to the smallest part of a soldier's work—fighting. Our notions of moving troops on land and keeping them supplied with the requirements for campaigning are hazy in the extreme; and it is only, as a rule, when an army is put in the field that the question of transport crops up. Then immense sums of money have to be disbursed in the purchase of transport animals and equipment, both very frequently of the most inferior quality and at a maximum price; men and officers who know little, if anything, of the management or care of the creatures entrusted to them, are drawn from regiments, chiefly infantry, and in the hurry-scurry of organizing the most essential requisites are ignored or forgotten. Our military talent certainly does not do much for us in the matter of transport organization, and it is greatly to be apprehended that if we were involved in a war of any magnitude, and especially with a European power, our deficiency in this direction would prove of far greater moment than it has done in the recent petty campaigns, which have so fully demonstrated our incapacity to learn useful lessons from former disasters.

Nothing more lamentable occurs to our memory at this moment than the grievous mortality among the transport animals of the army divisions in Afghanistan; a mortality which might, from all accounts, have been largely avoided if only reasonably common-sense precautions had been adopted, and for which the Indian Veterinary Department certainly cannot be held responsible, as we believe it urged the adoption of these precautions, and yet saw the immense congregation of valuable and most expensive animals move off towards Afghanistan without even one Veterinary Surgeon to advise as to their management, or minister to their injuries or maladies. The consequences we have already referred to, and we have no desire at present to enter into

the additional painful and disgusting details which have since come to hand The enormous losses are exciting much attention, and a *Times* telegram from Simla, of June 8th, thus alludes to them:—"The statement that 16,000 camels had been lost may be correct with regard to a portion of our forces, but at least twice this number have perished altogether, without counting other baggage animals. One estimate which ought to be trustworthy makes the total number nearly 40,000. It is earnestly to be hoped that the successful termination of the campaign may not prevent fullest inquiries into the causes of mismanagement so discreditable and dangerous. The Khyber force was for some time so helpless, owing to the want of transport, that it could not have advanced to Cabul if Yakoob Khan had defied us." We sincerely trust that independent authorities will institute a searching investigation into this disgraceful affair; for it is only by such inquiry that one of the most discreditable and dangerous defects in our military system can be remedied. If inquiry is made it will be clearly shown that at least a large proportion of the mortality was due to the advice of the Indian Veterinary authorities not being accepted.

THE FITZWYGRAM PRIZES.

THESE prizes which were open to all students who graduated at the Royal College of Veterinary Surgeons during 1878-79, were recently competed for with the following result:—

E. Simpson Shave, Royal Veterinary College, London, First Prize—£50.
T. Herbert Lewis, New Veterinary College, Edinburgh, Second Prize—£30.
W. Frank Smith, Royal Veterinary College, London, Third Prize—£20.

Reviews.

THE FOUR BOVINE SCOURGES: PLEURO-PNEUMONIA, FOOT-AND-MOUTH DISEASE, CATTLE PLAGUE, TUBERCLE. By Thomas Walley, M.R.C.V.S., Edinburgh. Maclachlan and Stewart. 1879.

It gives us much pleasure to welcome Professor Walley's praiseworthy monograph on four of the more serious bovine scourges known to Veterinary Surgeons in these islands. It is undoubtedly one of the best professional books on the subject, as distinguished from the popular "Cow-doctor" series, this century has produced, and reflects great credit on not only the author, but also on the publishers for their enterprise. The book, though it may be read with benefit by the more intelligent class of agriculturists, is essentially a work for members of the profession, and to them we can honestly recommend it. Pretty well everything that is known in this country with regard to the above-mentioned disorders is embodied in the author's descriptions; while from the large amount of original observation incorporated with them, the methodical arrangement, and the not too technical language, as well as the very excellent plates (nearly all of them coloured), the busy practitioner, no less than the Veterinary student, has at hand an excellent manual for easy reference. There is ample scope for the reviewer, and we feel inclined to criticise freely, and also, we are glad to say, favourably; but want of space forbids us doing more than merely alluding to two or three points, hoping our readers will patronise the work, which is really worthy of all the commendation we can bestow upon it.

The best parts of the monograph, in our opinion, are decidedly those which treat of the pathological anatomy of the four diseases; and the illustrative plates are an excellent supplement to the verbal descriptions. In Zymotic Pleuro-pneumonia, Professor Walley is almost entirely at variance with Dr. Yeo, whose report we published some months ago; and he certainly has some reason to complain—as have others—of the manner in which the Doctor treated his remarks on this malady, contributed to the VETERINARY JOURNAL in 1876. Professor Walley is no supporter of the notion that the disease can only be transmitted by the breath of the living animal; and he gives a formidable array of witnesses in support of his opposition. With regard to the efficacy of inoculation, he gives a halting opinion; but possibly, when his manuscript went to the press, the inoculation method practised by Mr. Rutherford in and around Edinburgh, had not then yielded the startling results we chronicle elsewhere. The subject of Foot-and-Mouth disease is almost exhaustively treated, and forms a very interesting section. Cattle plague is a scourge we fortunately do not see every day, but a knowledge of it is, nevertheless, very important. Professor Walley does not carry its history in this country beyond 1745, but a reference to "Animal Plagues" will show that there were probably several invasions of the terrible contagion before that period.

The section on Scrofula is one of much importance, and though it does not contain the latest observations, yet it deserves the attention of Veterinary Surgeons. Professor Walley, in common with all those who have studied the subject, denies that Tubercle is due to the absorption of broken-up matter.

There is an appendix to the work, on the inspection of live animals and of meat, which will be found of service to abbatoir inspectors and others, as well as a postscript on Zymotic Pleuro-pneumonia in American cattle, giving strong evidence in favour of oxen from the United States imported into this country being affected with this disease. The subject has been already referred to in the JOURNAL.

In this hasty notice of Professor Walley's *magnum opus*, we feel that we have not done it sufficient justice, inasmuch as we have not made long quotations from it to show its excellencies. But we can exonerate ourselves to some extent from qualms of conscience, by asserting that the book deserves well of the profession; it is the work of a close observer, enlightened pathologist, and an honest, steady labourer in progressive Veterinary science.

Proceedings of Veterinary Medical Societies, etc.

LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting of the above Association was held at the Blackfriars Hotel, Manchester, on April 9th, 1879. W. A. Taylor, Esq., Vice-President, in the chair, in the absence of the President, W. Dacre, Esq., who was unable to attend in consequence of severe indisposition. The following persons were present:—Messrs. P. Taylor, W. A. Taylor, T. Hopkin, E. Faulkner, M. J. Roberts, J. B. Wolstenholme, Jas. Paton, of Manchester; Messrs. R.

Reynolds and D. Hutcheon, of Liverpool; J. B. Taylor, of Ashton; — Bunnell, of Oldham; W. Woods, Wigan; W. Whittle, of Worsley; A. Darwell, of Northwich; H. Beard, of Macclesfield; — Pallin, Esq., 20th Hussars; T. Briggs, of Bury; Dr. Henry Briggs, of Liverpool; and the Secretary. Letters of excuse were received from Messrs. Professor Pritchard and McCall, J. Welsby, E. Sudren, Geo. Morgan, J. O. Martin, C. E. Elam, E. Woolner, and W. Dacre.

The minutes of the last meeting were read and confirmed, after which Mr. P. Taylor proposed for election as a member of the Association, Mr. J. B. Wolstenholme, of Manchester; seconded by Mr. S. Locke, and carried unanimously. Mr. Whittle proposed Mr. J. O. Martin, of Manchester; seconded by Mr. P. Taylor, and carried unanimously. Mr. Woods proposed Mr. H. Thompson, of Aspatria, Cumberland, as a member; seconded by Mr. W. A. Taylor, and carried unanimously. Mr. S. Locke proposed Mr. F. R. Ridler, The Mall, London, which was seconded by Mr. W. A. Taylor, and carried unanimously.

The SECRETARY then read the Report of the Fleming Testimonial Committee. There were twenty-nine subscribers, the total amount subscribed being £63 10s. 6d.

Mr. T. HOPKIN then read an interesting paper on "Antisepticity." He said:—Gentlemen,—We have latterly been so favoured with lectures and papers from professors and others learned in our art, that when one of the multitude takes the place of essayist, unless he is possessed of an unlimited amount of assurance, must feel no little trepidation.

This vaunted nineteenth century of electricity and accelerated locomotion has divided and subdivided all branches of science in such a manner, that the general practitioner finds it no light task to master the true theories and facts that the scientific specialist is from day to day supplying him with, and engaged, as we are, with multifarious duties of our active calling, it cannot be expected that we should undertake the solution of abstruse problems; but after the specialist has by careful research and experiment ascertained certain facts tending to unravel the laws of nature that have up to that time been mysterious and secret, it is clearly a part of our duty to apply them in such a manner that an enhanced success should follow the adaptation, and thus be able so to advance our profession by battling more successfully with disease and its sequel. The object of this paper will be to call your attention to investigations that have been latterly directed to the way in which "Antisepticity" may be successfully applied to surgery. It will be taken for granted that the old ideas of our forefathers, that all they required was a certain number of receipts or nostrums to be applied in a case as the best or only thing requisite for the successful practising of our profession, has exploded, and that any light thrown on the working of Nature's laws, any unravelling of her mysteries, will be received as priceless knowledge—such knowledge being power.

If we take, as an example, the discovery of the circulation of the blood by Harvey, and contemplate the amount of labour that must necessarily have attended the experiments, the painstaking research, the careful noting of facts, that discovery entailed on the memorable and honoured discoverer; and, on the other hand, the boon it has been to mankind, you will see that Harvey did a work of far greater magnitude than a generation of ordinary practitioners—his discovery must remain a monument to him for ages, whilst the others glide away with scarce a memento left to mark their existence. To the most casual observer it must be patent in thousands of ways, the intimate relation existing between cause and effect; but modern science and her appliances teaches, as it does, the infinity of the infinitely little requires both perseverance and intellect to follow her. A man may fracture a limb

by falling: be he possessed of the slightest power of reason, he will easily recognize the fact that the fall was the cause, and the fracture the result; but it will require the educated scientist to recognize the causes and effects of many of the complicated processes that will have to come into operation before it terminates in resolution, or one or other of the more unfortunate terminations following the solution of continuity in the osseous system; and whilst the intimate relation existing between cause and effect can be ascertained and demonstrated by experimental research in branch of science dealing with the inanimate, there are some facts in connection with ours that humanity forbids the some prodigality of experiment; and whilst some amount of vivisection is undoubtedly justifiable, we forget that any new fact noted and proven in the daily clime is a step towards the solution of some mystery, and it is to be feared that often when we stumble across those gems by not noticing them, they drift back into the dark sea of the unknown. Abundant proof is to hand, that for centuries man has been aware of the fact that certain diseases could be conveyed from one system to another in some mysterious way, but without the slightest idea save and except such as they obtained by conjecture as to what this potent but baneful agent could be that carried death and disease over the land. During the last twenty years Pasteur's researches, with regard to the processes of fermentation and putrefaction, have given rise to what is commonly known as the germ theory of disease. It is not necessary to discuss the question *in extenso* as to whether all our infectious diseases are due to germs, but I wish you to note carefully the similarity in the action of fermentation and some diseases. This is beautifully illustrated by experiments conducted by Dr. Roberts, of Manchester. In one he filled two pint bottles with saccharine wine, and inserted a delicate thermometer in each. A. was inoculated with a minute quantity of yeast, but nothing was added to B. Both bottles were placed in a warm room 70° F.

In order to get a correct standard for temperature, another bottle C, with thermometer, was placed beside them. The bottles were carefully swathed in cotton wadding to obviate the change in temperature as much as possible. For twelve hours no change took place, but at the end of this time A began to ferment with rise of temperature. On the second day it was actively fermenting, and its temperature was 2·7 degrees above B and C. This disturbance continued for five days, the temperature ranging from two to three degrees above the companion bottles. The disturbance then subsided, and the temperature fell to an equality with B and C, and the sediment of yeast settled at the bottom. In the meanwhile B showed little alteration, but fermentation set in on the sixth day, following a similar course to A.

Dr. Roberts says this fever in a bottle resembled small-pox in the following points—inoculation period, incubation, disturbance and elevation of temperature, succeeded by a subsidence of the disturbance and a return to the normal state, multiplication of the infective material, and after conclusion liquid protected from infection by same contagium. Second part shows fermentation can be produced either by direct inoculation or fortuitous infection through the atmosphere. The comparison fails, however, in one point—a chemical change takes place in one and not the other. Sugar is changed into alcohol and carbonic acid; whilst, so far as we know, no chemical change takes place in the blood and tissues in small-pox. Putrefaction and certain diseased action are even more intimately allied than fermentation and fever.

I have in this bottle a small aquarium of my own cultivating. A piece of fresh muscle was placed in a jar, and after being covered with water it was allowed to stand exposed in a warm atmosphere for several days. Upon examining a drop of this liquid under the microscope I find that there are thousands of living, moving specks visible—these are termed "bacteria."

We have here induced the process of putrefaction, one of the essentials to which is the presence of bacteria. You say, How do we know that? Because it can easily be proved that if you prevent bacteria or their germs entering the liquid, no putrefaction takes place. I have here two tubes which, after filling with wine, we boiled so as to kill any bacteria there may be in them, and then cover one with cotton wool and leave the other exposed, placing them in a suitable temperature, you will find that the one in which the air that comes in contact with it has been filtered through cotton wool, no change has taken place; in the other, the process of putrefaction is going on. And, as must be patent to any one examining them, this proves several things. Firstly, that the organic matter has no inherent power of generating bacteria. Secondly, matter has no inherent power of passing into decomposition. Thirdly, that bacteria are the actual agents of decomposition. Many far more elaborate and conclusive experiments have been performed to prove these facts, but I will only just briefly allude to them. Turnip-water—two specimens that were kept for over two years. Ozone was passed through one and the air filtered: it remained *in statu quo;* whilst the other was green, thick, and very offensive.

Professor Tyndall has proved that air, optically pure, will not produce bacteria. When a ray of sun or other concentrated light is passed through a bottle containing filtered air, nothing is visible; whilst the ordinary atmosphere contains particles of dust which reflect the light and give a beautiful luminous track. I say, Professor Tyndall has proved that when air is in this state, organic matter does not putrefy; but only introduce a drop of water or anything that has been in contact with the atmosphere, and the processes commence at once. You who have seen what minute things bacteria are, will at once conclude how difficult it is to detect the germs that produce them. What has already been said pretty clearly proves that they are due to germs and not to spontaneous origin. Two facts, however, came to light that almost upset this. The first is that bacteria are invariably killed when exposed to a temperature of 140° Fahrenheit or any higher temperature. The other fact is that certain liquids as neutralized—nay, infusion and milk often produce bacteria after being boiled—sometimes after several hours boiling, and where there was no possibility of subsequent injection. This looked like spontaneous generation. Professor Cohn, of Breslau, has, however, thrown some light on the mystery. He found that whilst 140° Fahrenheit might kill the parent, the germ or spore was not affected by a very much higher temperature. Mr. Dallinger and Dr. Drysdale have also demonstrated that whilst certain living monads were killed at 140° Fahrenheit, the spores, which are so minute that they cannot be detected by the highest power of the microscope, except in masses, are capable of germinating after being subjected to a heat of 300° Fahrenheit for ten minutes. One of these experimentalists most graphically describes the minuteness of these objects. He says they cannot be called, for an object is a thing of which we can take cognizance by some of our senses aided or unaided, and that germs lie so completely beyond the powers of our present instruments that their existence is for the present a matter of inference and not of direct observation.

Although at present beyond our ken, we can say, "By their fruits ye shall know them." For the purpose I have in view it will be necessary for me to prove the connection between bacteria and a septic state of the system, as seen in Septicemia, to which I shall refer presently.

Burdon Sanderson, after killing healthy rabbits, immediately took some internal organ, as liver or kidney, and plunged it in fused paraffin at 230 degrees, and, after allowing the mass to solidify, covered it with Venice turpentine to prevent any air getting to it through the cracks that were apt to

form in its cooling. After several days, on cutting into it, the outer portions were cooked with the hot oil or paraffin; temperature had been sufficient to coagulate abumen, but an internal kernel was red, proving that the temperature here had not been sufficient to coagulate albumen, and upon examination was found to swarm with fine active bacteria; and the conclusion he is forced to is that either bacteria or germs were present in the organ, and that whilst it was healthy. The blood of animals, when due care is taken in extracting it so as not to permit of its being infected from without, does not normally contain either bacteria or their germs. That they can readily enter the animal system by mucous membrane of bowels, lacteals, and pulmonary mucous membrane, there is no doubt. After elaborately arguing the matter, he comes to the conclusion either that the bacteria are formed and are immediately afterwards destroyed, or that they are not allowed to germinate. Whilst we have abundant proof, on the one hand, that the normal blood does not contain bacteria, we have also proof, on the other hand, that in peritoneal and pleural effusions in rodents, however produced, it invariably happens that the exudation liquids contain swarms of bacteria.

By the term Septicemia is meant the aggregate of the effects which are produced in the animal organism when putrid matter is mixed with the blood stream. Artificially, this can be readily produced in the dog, and is analogous in the course it runs, and the symptoms to which it gives rise to the fatal Septicemia of our hospitals, commonly called hospital fever. There are many reasons why our patients do not suffer so frequently from this disorder as man. But that it has been the cause of death (although overlooked at the time) to numbers of our patients, I shall be able to prove clearly—I believe before the close. Dr. Burdon Sanderson, in one of his lectures, "On the Infective Processes of Disease," speaking of Septicemia, says:—"Inasmuch as we cannot be certain in any case of chemical Septicemia that the symptoms or *post-mortem* results are exclusively due to sceptic contamination, it is clearly necessary to take the experimental facts rather than the clinical as our starting point." After detailing many of the experiments on this subject by continental authorities, he takes the symptoms as exhibited by a dog after septic matter has been injected, and compares them with the symptoms as found in this disease in man; shows the analogy of these and *post-mortem* appearances as well. He then goes on and proves clearly that although septic matter does not necessarily contain bacteria, *yet it cannot be produced without their agency.*

His reasons for coming to this conclusion are best given in his own words:—"So far as our present knowledge reaches, none of the known chemical products of the putrefactive disintegration of albuminous compounds can be indicated as the cause of the toxic action of putric infusions; for in respect to each of them we have experimental evidence that, when separately introduced into the organism in such quantity as would correspond to a poisonous dose of the septic liquid of which it is a constituent, it produces no toxic effect whatever. The inference is therefore suggested that the poison is not any product of the septic disintegration of proteid bodies, but a something which is much more intimately associated than any of them are with the existence and growth of the ferment organisms themselves."

This inference has been fully justified by experiment. It has been shown by Professor Bergmann that the septic poison can be produced by the action of bacteria on material which contains no albuminous compound. He found—and we are now familiar with the fact by repeated experiments—that if you grow bacteria in the cultivating liquid to which I previously referred, of which the composition is given in the table, the first crop of bacteria is inert; but, eventually, you obtain a product which possesses all the virulence of putrescent animal or vegetable infusions, notwithstanding that the original liquid contained only sugar, ammonic, tartrate, and certain inorganic salts.

Let us endeavour to realise what happens. We have to begin with, virtually, a solution of ammonic tartrate; for it can be shown that it is all that is wanted at the outset. Into that solution you introduce at one side, say a bit of glass, which has not been calcined, and of which the surface is consequently contaminated, *i.e.*, beset with germinative particles. The vegetation takes its start from the surface of the glass. One after another bacteria emerge into existence and visibility, and multiply with a rapidity which you can easily calculate on the datum that each becomes two within about an hour after its birth.

Having our bacterium, how does it manufacture its virus?

In order to obtain an answer to this question, I will ask your attention to the following experimental results, which, irrespectively of their bearing on the present question, are of value for the additional evidence they afford of the fundamental proposition of this lecture, viz., that Septicemia is not due to the direct action of living bacteria on the blood and tissues:—

Some years ago Dr. Hiller, one of the most energetic and able opponents of the germ theory, made an experiment which has been the subject of much discussion. Having succeeded in collecting a considerable mass of bacterial material, that is of bacteria obtained from various fluids in advanced putrefaction, on a filter, he washed the mass, just as one washes a precipitate, a great number of times, and injected it in repeated doses into the circulating blood of animals. The injections were entirely without effect. Hiller next proceeded to inoculate himself with the same material, and again without effect. The advocates of bacteria at once objected to Hiller's experiment, that the bacteria not being accustomed to distilled water were so injured by the repeated washings that they had lost their activity. The criticism, however, might just as well have been spared, for it afforded Hiller the opportunity of proving by experiment, which was of course easy enough, that the washed bacteria were as lively and as capable of development as ever.

But there is another way in which inactive bacterial liquid can be prepared, a way to which I have already adverted. In any cultivation of bacteria in a nutrient solution, the first crop (if I may use the expression) is always inert. It is not until the bacteria have gone on for many days dividing and dividing that they begin to develop their poisonous properties, at all events in appreciable quantity. This can scarcely mean anything else than that the mode of vegetation changes, viz., that the bacteria first formed have their place taken by others of which the form and the physiological endowments are different. Every one who is familiar with the growth of bacteria in cultivating liquids knows that there is a marked difference in appearance between the first and subsequent growths, the former consisting mostly of rods (bacteria proper), which appear early; the latter of spheroids or micrococci. They differ not only in form, but also in the fact, that whereas the rods are endowed with great mobility and appear to act independently, as if each had a consciousness of its own; the latter are held together in masses by transparent interstitial substance (glæa), and usually form a scum or pellicle on the surface of the liquid. The meaning of these facts seems to be this. It is obvious that in every liquid in which successive generations of organisms grow in the way I have described, each generation must alter the composition of the liquid; and that this change may consist not merely in the discharge into the liquid from the bodies of such organisms of the "waste products" of their vital processes, but also (in case any of the earlier generations instead of continuing to live are disintegrated) of the products of such disintegration; so that, in the latter case, it is quite possible that a liquid which was at first non-albuminous may, as the process goes on, contain an appreciable quantity of proteid matter. That any such formations of plasma actually takes place cannot be asserted. All that we know on observation is

that the later generations differ as regards their morphological characteristics from the earlier, and that they alone possess toxic properties; so the two processes must go on side by side—a change in the composition of the liquid, and a corresponding change of the organisms which grow in it.

Experiment has proved that if the exudation of simple peritonitis be injected fresh into the peritoneum of another animal, the disease assumes a more intense form in the second than the first, and if by artificial selection the most severe cases be taken, and the exudate from that case be used for further transmission, a still more intense inflammation will be the result.

When either nature or circumstances causes this course to be followed, we get what may be termed "malignant" peritonitis. It will readily be seen from what has already been stated, that when you have a number of cases in which the process of putrefaction is in operation, that you will be likely to get the formation of *septic* matter. Now do we find this to be the case? The answer to this query must be in the affirmative. We know perfectly well that the high rate of mortality in the surgical hospitals is produced by Septicemia, and the army surgeons tell us in their records of practice, during active service, that the thing most to be dreaded is Septicemia—a greater percentage of the wounded dying from this rather than from the severity of their wounds, and that if once established nothing could be more disastrous. Why our patients do not suffer to the same extent may be attributed to several causes. Those of you possessing a knowledge of comparative pathology will bear me out when I state there is not the same tendency to Septicemia in herbivorous animals as the omnivorous and carnivorous. Experiments prove that in some liquids bacteria do not thrive as well as others, nor produce the septic poison; but whether the septic matter is not so abundantly formed, or whether when formed circumstances do not favour its absorption in the majority of our cases, we have not absolute proof, but there is indirect proof sufficient, I feel satisfied, to lead us to conclude that both these surmises are correct. We know that the discharges, many of them, swarm with bacteria, but there does not appear to be the septic poison, or at any rate its toxic effects are not made visible, either from absence or non-absorption.

(*To be continued.*)

LIVERPOOL VETERINARY MEDICAL ASSOCIATION.

THE fifty-ninth quarterly meeting of this Association was held at the Medical Institute, on May 9th, 1879. WILLIAM WHITTLE, Esq., Vice-President, in the chair.

There were present—Messrs. Elam, Moore, Morgan, Wilson, Reynolds, William Leather, Stevenson, and Chisnall, of Liverpool; H. Barnes, Malpas, Roughsedge, St. Helen's; M. Barron, Sutton; Woods, Wigan; Storrar, jun., Chester; and the Secretary. Letters of apology were received from Professors Williams, Walley, Pritchard, and Axe; Messrs. Hopkins, J. and A. Lawson, G. R. Dudgeon, D. Dudgeon, A. H. Darwell, J. B. Wolstenholme, T. Taylor, Sam. Locke, H. J. Cartwright, and J. Welsby. The minutes of the previous meeting were read and confirmed.

Mr. WILLIAM LEATHER then exhibited the brain of a horse, of which he gave the following description:—

"The animal was a grey cart gelding, eight years of age, in moderate condition; had been at work in Liverpool about twelve months. He was at his usual work on the 22nd of last December, and was brought to the infirmary on the 23rd. *Symptoms*—Pulse 50, of medium strength; respirations normal; temp. 103° F. A swelling in the right orbit, which completely closed the eye; the left eye was natural. On approaching him from the

right side, he would turn away as if afraid of its being touched. I carefully examined for some external mark, but failed to discover any. His appetite was moderately good.

24th. Symptoms unaltered.

25th. I observed a discharge of a thick fœtid character from his right nostril. There was also an increased secretion of saliva, which is seen to accompany sore throat, but he evinced no difficulty in swallowing.

26th. Pulse 62, and weaker. Temp. 104° ; appetite deminished.

27th. Pulse and temperature unaltered, but on being approached from either side he would suddenly wheel round and appear unsteady for a few minutes. The discharge from the nostril had ceased.

28th. Pulse 45, temp. 103°. Unsteadiness increased. Could be made to move with difficulty, and ate carrots and green food when handed to him.

29th. Pulse 45, temp. 103°. Extreme weakness. He fell down in the afternoon, and died the same night.

Autopsy.—The thoracic and abdominal viscera were healthy. On removing the surrounding tissues of the right orbit, and reaching the parts adjacent to the orbital and maxillary hiati, they presented a greenish colour, and were mixed with fœtid pus ; the divisions of the fifth pair, or trifacial nerves, which pass through the foramina of the hiati, were also extensively diseased. On dissecting out the brain, I found it highly congested, and an abscess containing about two ounces of pus situated on the right side, and at the base of the cerebrum at its junction with the cerebellum." In reply to a question, he (Mr. Leather) said that the pus was not contained in a sac, nor had the animal any appearance of strangles.

A conversational discussion followed, in which most of the members present joined, the principle points touched upon being the origin of the abscess, and whether it was caused by an external injury, the result of extravasated blood, or was related to strangles.

Mr. BARNES then communicated the notes of a case of disease of the brain of a horse :—" The subject was a cart gelding, three years of age. He was put to light work—gave every satisfaction—but always evinced a dislike to have his head touched. He was turned out to grass the following summer (1878), and a few weeks afterwards he was observed to have a difficulty in depressing his head, and to be falling away in condition. I was then requested to see him, and on examination found a large, hard, fluctuating swelling on the off side of the cervix. After the application of hot fomentations and a blister for nearly a week, I lanced this swelling, and gave exit to a large quantity of pus ; and, on further examining the wound, I found it deep-seated, and the tissues involved completely destroyed. I had the wound well syringed out and dressed daily. Under this treatment it continued to improve, and the horse was discharged in October. A very slight discharge still issued from the wound, but this I anticipated would gradually cease.

" On the 30th January, 1879, the horse was put to draw a load of corn to the railway station, a distance of two miles ; but when about half the journey had been completed, he was observed to stagger, and immediately began to perspire freely. After standing for a few minutes, however, he apparently recovered, and proceeded with the load, completing the journey, although manifesting signs of drowsiness and disinclination to travel. On arriving home, his owner observed him to be very stiff in turning, hanging his head, and appearing sleepy.

" He then administered a stimulant, consisting of a quart of warm ale and a little ginger, and afterwards gave him a dose of physic. There appeared to be little improvement, and three days after I was requested to see him.

" I found him with his nose in the manger and his head pressed against the rack ; eyelids half closed ; lips pendulous ; pulse and respirations slow ; and

partial paralysis of the whole body. On elevating his head for the uprpose of giving him a draught, he became greatly excited, reeled, and feel backwards.

"*Treatment.*—I abstracted about five to six quarts of blood, administered a dose of physic, placed him in a comfortable loose box, clothed his body well, and ordered cold cloths to be applied to his head constantly. The following day the bowels were relaxed, but the animal was unconscious—holding his head to the right side, and turning round in the same direction. He remained in this condition for five days, and on the sixth he was found down, struggling violently, and steaming with perspiration. I advised the owner to have him destroyed.

"*Autopsy.*—I found the right hemisphere of the cerebrum enlarged, and containing about two ounces of pus." In reply to a question, he said that the abscess was not in the substance of the brain, nor did it appear to be contained in a sac.

Mr. BARNES also exhibited a specimen of Ostitis, with a deposit of new bony matter on the sixth and seventh cervical vertebræ, of which the following are the notes: "The subject was a grey mare, five years old. I was called to examine her on the 8th of February. I found her lame in the offfore leg, accompanied with atrophy of the *antea* and *postea spinati* muscles of the same shoulder. This, I concluded, was the result of a sprain.

"*Treatment.*—Rest; hot fomentations, followed by gentle stimulation; which was continued for a fortnight with satisfactory results. The following week she lost her appetite, and exhibited symptoms of stiffness in the neck, accompanied with general wasting of the cervical muscles. On manipulating the inferior portion of the cervical vertebræ, the animal evinced great pain. I ordered hot fomentations and stimulating embrocation to be applied daily, accompanied with the internal administration of vegetable tonics. This treatment I continued for a fortnight, with no beneficial results, when I informed the owner that I anticipated an unfavourable termination, and asked to be allowed to have a professional gentleman in consultation. Mr. Cartwright, of Wolverhampton, was called in on the 4th of March, and after a careful examination together, we came to the conclusion that the atrophy of the muscles was the result of concussion to the cervical vertebræ. And, on inquiry, we ascertained that, about a month previous to my *first* visit, she had broken loose whilst out at exercise, and was supposed to have leaped or fallen over some iron hurdles. A fresh sheepskin was applied to the neck for twenty-four hours, after which a strong embrocation was rubbed over the whole of the neck, and vegetable and mineral tonics were given internally, but with no improvement.

"On the 26th of March she was found down, and unable to rise. The following day I recommended her to be killed.

"*Autopsy.*—On stripping the skin from the neck, I observed the muscles of the inferior cervical region to be of a peculiar greenish colour, and on cutting down to the bone, a small quantity of a greenish looking pus made its appearance, which convinced me that extensive disease of the bone was present. On examining the two vertebræ involved, you observe that the deposit of bony matter extends within the neural canal, as well as upon the outer surface of the bones; and I would like the opinion of the members on the following peculiarities of this case, viz.—(1) The length of time between the supposed cause of the injury, and the first symptoms of lameness; (2) Why was there not immediate stiffness of the neck, with excessive pain? and (3) Why should the muscles of the shoulder be the first to become atrophied?"

An interesting discussion followed, and the general opinion expressed was that the original cause of the diseased condition had been a shock inflicted

on the bones of the neck, setting up inflammatory action; and as this inflammation, from the appearance of the deposit, seemed to have commenced within the neural canal, and to have extended outwards, it was considered that the nerves distributed to the shoulder had become involved in the diseased condition, previous to its being so extensive as to affect the contiguous muscles of the part. Thus accounting for the interval between the injury and the shoulder lameness, and also for the shoulder lameness preceding the stiffness in the neck itself.

Mr. ELAM exhibited the top of a large iron rail, weighing several pounds, which he had extracted from the abdominal cavity of a cow, and of which the following are the notes:—"The cow, in trying to leap over the railing, got impaled on the top of one, and the parties in attendance being unable to get her off, procured a hammer and broke off the head of the rail, leaving it enclosed in the abdominal cavity. I was not made aware of this on my arrival to see the cow, and not until I had carefully returned the bowels which protruded, and had stitched up the wound, was I told that there was a lump of iron inside.

"I then undid the stitches, and by careful manipulation succeeded in extracting this massive cone-shaped rail-head which you see. It, fortunately, had a very obtuse apex, and, consequently, had not penetrated the bowels. I then re-stitched the wound, fastened a truss on the part, had the animal kept quiet, gave sloppy diet, and a little aconite to allay the excitement during the early stages. In about a week a small abscess formed; this I opened, and in three weeks the cow was well."

Mr. ELAM also exhibited a specimen of *Mollities Ossium*, in a five-year-old pony. The part shown was the head; but the whole of the bones of the body were similarly affected. The pony was the property of Mr. Hengler, and had been used by him in the circus for carrying performing monkeys, but he did not know anything further concerning its history.

A discussion as to the cause and pathology of this diseased condition followed, but no very definite conclusion was arrived at.

A vote of thanks to Messrs. Leather, Barnes, and Elam for their contributions was carried unanimously.

The Secretary nominated Mr. T. E. J. Lloyd, of Liverpool, for election as a member of the Association.

A vote of thanks to the Vice-President terminated the meeting.

DUNCAN HUTCHEON, *Hon. Sec.*

THE LONDON VETERINARY SURGEONS *VERSUS* THE ROYAL VETERINARY COLLEGE.

A LARGELY attended meeting of Veterinary Surgeons was held on June 5th, to consider the question of fees pertaining to Veterinary practice, and especially the system of competition maintained at the Royal Veterinary College. In the unavoidable absence of Mr. COLEMAN, Mr. R. WARD, F.R.C.V.S., was called to the chair.

The CHAIRMAN said:—I think you are aware that the object of this meeting is to take into consideration the effect of the competitive fees of the Royal Veterinary College on the Metropolitan practitioners. I will ask Mr. T. Moore, the convener of the meeting, to explain the origin and object of it, after which we will open a discussion on the subject.

MR. T. MOORE: This meeting is the outcome of some correspondence published in the VETERINARY JOURNAL for November and December of last year. In considering, first of all, the fees pertaining to Veterinary practice, I am of opinion they are very inadequate, especially that for examining horses as to soundness, knowing that if by chance we overlook some defect,

we may be held liable to the extent of a hundred pounds or more. I am of opinion the fee should be regulated in proportion to the liability, and on some percentage scale, as in many other professions; for instance, if you ..ake the opinion of an architect regarding a house of the value of £100, you would be charged £5. As you are all aware from the advertisements of the Royal Veterinary College, for a sum of two guineas per annum the professors examine twenty horses, and for five guineas an unlimited number, also any number of horses may be sent there for treatment by paying only for their keep. I ask you which of us can afford to do that and pay the rents and expenses we have to do now-a-days? Supposing one of us offered to treat a horse on these terms, would it be considered honest? Would it not be said he intended to recoup himself in some other way? I hold in my hand a copy of the "Bye-Laws and Regulations referring to Subscribers of the Royal Veterinary College," published this year. It details the privileges accorded to the subscribers, and on p. 15, bye-law 8, provides, that "The professors are not to examine horses as to soundness out of the College, nor visit sick animals (otherwise than in the course of investigating any such outbreak as aforesaid), except by special permission of the Principal, and then only with the object of their removal to the infirmary for treatment, if this be found convenient and safe." You are all aware that the first part of this bye-law is totally disregarded, and the latter part inflicts great hardship upon us. This also applies to Regulation No. 6, p. 28 (if we regard the professors as servants), which says, "No servant of the College shall, under any pretence whatever, accept of any present."

In 1791, when the Veterinary College was established, there was nothing of the kind existing—in fact, I may say the Veterinary profession did not exist. The school was started by a Frenchman named Sainbel, who, to obtain the funds necessary for his scheme, inaugurated the two guinea subscription, and we may fairly conclude that the contributors to the fund acted from purely *charitable* motives. There is not now any necessity for an exhibition or continuance of charity; for the College must have a considerable reserve fund, and a large annual income, derived principally from students' fees, which of late years have been increased one-third without any proportionate disbursements. I may mention here that the Royal Agricultural Society of England, numbering over 7,000, have the same privileges as the subscribers to the College, without any payment, beyond the annual payment to the Society of one guinea. A little interesting information may be culled from the book I have here, but there is not sufficient data to make it reliable. The College has been fortunate in getting legacies to the amount of £982. The life subscriptions for the last forty years amount to £1,554, which is invested, and the accrued interest must be very handsome by this time.

The annual subscribers number 1,028, paying annually £2,158, or so. The new annual subscribers in 1878 numbered 191, and the sum paid by life subscribers during the past ten years exceeded by £130 the amount derived from that source during the whole of the thirty years previous. Taking students into consideration, the annual income of the College cannot, I fancy, be far short of £10,000. Financial statements of the College are kept rigidly secret, although the public has a right to know something on this point, considering a Parliamentary grant was made some years ago, and no account rendered as to what became of it. I hardly think the financial part has anything to do with us; it only shows we are considerable losers; but, for all that, I for one am glad to see the College has prospered so well, and hope it will continue.

Among the list of subscribers, I find the names of thirty-five London horse-dealers, who send a large number of horses to be examined, and sell them according to the certificates, and of course to the detriment of the Veterinary surgeons practising outside. There are eight names of what may be

called "gentleman dealers," including some of the large job masters. Also the name of one farrier who practices as a "Veterinary Surgeon," and with whom one, at least, of the professors goes out in consultation. I note that one of the subscribers is described as an "Esquire," but I know him to be a coachman. (Laughter).

It is asserted that the subscriptions are necessary to obtain subjects for the practical education of the student. This is throwing dust in the eyes of the public. In the Scotch schools no such system exists, and no one can say the graduates of those schools are less practical than the London ones. It is obvious that practice is necessary for the professors, but is there any reason why they should obtain it on terms which place their brethren at a disadvantage?

I have been told that as the Royal Veterinary College is a private speculation, we are not likely to succeed in our attempts at reformation; but I think we might try and see what we can do.

Mr. GASKIN: I quite agree with the last speaker that a guinea fee is inadequate for the examination of a horse as to soundness; but I believe it would be impossible to bring the fee to a fixed rate of five, or two-and-a-half, per cent. on purchase money; I think a fee of two guineas would only be adequate remuneration for the labour and responsibility of examining a horse. With regard to the professors examining horses outside the College, I think a resolution censuring them for so doing might go a long way in remedying it.

Mr. CATTRALL: It gives me great pleasure to attend this meeting, and I may say that to some extent I have had a deal of experience within the College walls, and taken a prominent part there for years.

I must confess it seems to me there are many difficulties attendant upon bringing this issue to such a position as will satisfy ourselves, and make the whole condition uniform; I should have been glad if Mr. Moore could have pointed out some road to relieve us of that difficulty. One thing is certain, we must have a great deal of confidence in each other, and whatever we do we must do it with a full determination; if we intend to make any objection to what is carried out within the walls of the College, we must do it so that afterwards we should not be ashamed of it. (Hear, hear). If any gentleman can supplement, or assist me in supporting, my remarks in that direction, I, for one, will be glad to act. I must confess that in endeavouring to make a suggestion, I should be also making a leap in the dark. I think so far as the uniformity of the examination as to soundness fee is concerned, that we are in a better position than formerly, and we have no right to expect more than a guinea, which I consider a fair fee; and it carries with it a professional status.

Professional jealousy seems to be hereditary among us; why, I cannot say, for I am sure that every gentleman who is connected with our profession need not be ashamed of it. With regard to liability for errors in examining, I think that, although it may be law, it only applies to a specified condition, and I shall be glad to be corrected. We must all feel some regard for the College, having obtained our diplomas there; but things are done there which I regret. I agree with Mr. Moore about taking so many horses; I think if there were a better state of harmony brought about it would be better for all of us. (Hear, hear.)

Mr. ROGERS: I have been in the profession for some years, and it is the first time I have heard we were liable for damages in giving a wrong opinion in examining horses. As to the other matters, it appears to me the remedy is simple. Go to the College, point out the abuses and the remedies we propose, and hear what they say. I say this—the subscriptions ought to be done away with. I know they do a deal of harm; I only had one client who

subscribed to the College, and I won't have another. I say it ought to be put a stop to, and the sooner the better. (Hear, hear.) I intended at one time to put on my bill-heads, "No business done with subscribers to the College."

Mr. J. MOORE: There can be no doubt whatever that we are liable for damages in case of error in examining horses as to soundness. A short time ago a veterinary surgeon certified a horse to be five years old, when it was only four. The case was tried at Leeds, and he was mulcted in damages. Quite lately a member in London compromised a case rather than go into court, and he is nearly £100 out of pocket. I do not think there is any escape from liability. Doctors are liable for negligence to their patients, cases having been decided over and over again; so why not veterinary surgeons? Regarding the College, I thing it is time something was done to remedy the existing abuses, and bring about an amicable feeling amongst the members of the profession in London. I do not think it was ever intended that the professors should practice so much out of doors. It is not at all elevating to the profession. You will all remember the case of Mr. Paradise, and how Professor Pritchard gave evidence against him, although he acknowledged he had never seen a case of the kind. (Cries of shame.) No doubt the jury gave a verdict on the strength of the "professor" title, thinking a professor could not make a mistake. Was that like what a professor's conduct should be?

Mr. T. S. PRICE: I think the liability for neglect in examining a horse would depend on the way the certificate was worded. I should think this would answer:—"I have this day examined, and *do not detect*," &c.

The CHAIRMAN: If you go into a court of law you must give a definite answer. You will be asked, was that horse sound or unsound? did you try to detect. A certificate to be valuable should also be definite.

Mr. J. ROWE said he had the misfortune to reside near the College, being just within half-an-hour's walk, and without hesitation would say there was not a "Veterinary Surgeon" in London, within two or three miles radius, of even twelve months' practice, who had not some complaint against the College fees and its working. (Hear, hear.) Competition being so great in these days, practitioners must accept some work, or see it go begging—that meant for it to go to the farriers. In the case of subscribers whose horses he shod for years, he had not received a sou, and why? Simply because in the list of subscribers there were twenty-seven names of his clients. They ask him, "Will you shoe my horse for five shillings? I subscribe to the College, and can get him done for that sum there." He asked six, and they said they would send their horses to the College; and he accepted the lesser rate rather than they should do so, and hoped for the chance of professional service, as so many reside in his immediate district. As he could not compete at two guineas for twenty horses, he shod for the five shillings to keep the College out of it, which he would not do with a practitioner. (Hear, hear.) He was summoned some three or four months ago to attend a horse at 7 a.m. He found the animal very ill, and attended again two hours later, when he was told, "You need not come any more, I have sent to the College." The horse was there some seven weeks. He, Mr. Rowe, was accustomed to such cases, many horses he shod were first examined and afterwards treated there, and he had almost ceased to complain about it. He thought that the fees the College charged was only "a draw" to pay them in another way. Until lately he thought the two guineas paid for everything but keep, now he understood operations and medicines supplied were extra; the horse goes to the College, and remains there a long time, not infrequently six or seven weeks. (Voices, months.) Could we keep our cases for that period? (No.) Notwithstanding all this he always bore the College good-will, for it sometimes cures the subscriber's faith, and then he employs an outsider on the

next occasion, who invariably does his utmost to get the horse well as soon as possible; for a long standing case is detrimental to him. He agreed with Mr. Rogers that we should address the Governors; we required a little more support and acknowledgment at their hands. The question resolved itself into this, "Who will bell the cat?" The guinea examining fee has been objected to as too small—in the West end it is a paltry remuneration for examining an animal valued at £200 and upwards; but he very much doubted if we should get it raised, as there was great difficulty in getting that, and he had been refused it, because it was to be done elsewhere for ten shillings and sixpence, and for two shillings and three halfpence (at the Royal Veterinary College). We must therefore crack nuts with our friends outside before and while we go to the College. He knew we were liable for incorrect examinings, etc., and could enumerate three instances. By putting the notice on the bill-head or forge wall you do not evade the law, but may blind the customer. The law was law.

Mr. ROGERS: I have a law on my bill-head.

Mr. ROWEY: No, sir. To those gentlemen doubtful on this point, I would say by all means join the Mutual Benevolent and Defence Society; if you are in error you have a number of gentlemen ready to come forward and testify to your error. Then you must pay and have done with it; or, if in the right, to carry you through it. With your indulgence I will also state that the College has this week woke up to this meeting, or a sense of their false position, in treating the opulent and needy alike in their "fees"—"*save the mark!*" It has on the entrance gate a piece of paper posted up, to the effect "that anybody not overstocked with this world's goods, attending there on certain days between two and four, may have advice for nothing, and medicines for one shilling." I think this an attempt to compete with the chemist, and is so far good that it may also afford some practice to the pharmacy students within.

I trust I may not be accused of personality, for I intend none; and for the professors I have the highest respect, numbering personal friends among them. I consider that their position outside the walls of the college should be purely as "consultants," for which there is ample scope; that their attendance at the Law Courts in town, and the four quarters of this country, now so general with them, is prejudicial to the best interests of the profession, and good feeling among its members; and they should only be sought as referees in very important cases involving grave consequences, as otherwise the title they bear of "Professor," is calculated to carry the day in favour of the fortunate side retaining them. On another occasion I hope to add further. The matter requires attention at your hands, and to be well agitated among the London members generally.

Mr. PRICE: I should like to draw your attention to a circumstance that occurred a short time ago. I was attending a suspected case of glanders, and the owner told me he was a subscriber to the College, and could get any of the professors to visit him for five shillings and one shilling for "bus" fare. From after inquiries I learnt that the professor could not go, so the College sent the hospital surgeon, and he was paid the six shillings. Nine months ago I attended a cob, and going one morning found he had vanished to St. Pancras; he was there six months, the bill came to £30, and instead of charging their ordinary rates as per advertisements, they only charged fifteen shillings per week, which they have no right to do. I am in a position to prove the truth of my assertion, if necessary.

The CHAIRMAN: Gentlemen, this matter pertaining to the College competition with its graduates has been discussed in the VETERINARY JOURNAL and Lay Papers during the last year or so. In the VETERINARY JOURNAL of 1875, and in the *Live Stock Journal*, last year, one "Junius," a member

of the profession, started the subject. He made out that the College had not made strides in scientific research, but had extended its area for much business, and that the sending forth from its portals a duly qualified student as a veterinary surgeon did not appear to be its aim. The articles also spoke of the little progress the science of veterinary medicine had made under the late professors. I wrote in reply to "Junius" (in *Live Stock Journal*, October 11th, 1878) :—"Under the present Principal much has been done in the College interior; no one can complain of its requirements as a Veterinary establishment on a large scale, and although the pupils' fees have been augmented some thirty-five per cent."—it should have been ninety per cent. —"the College fees to the subscribers are the same." Here I give the College tariff and ask, "Can the public complain? Can 'Cavalier' complain? Certainly not. The institution should be popular with them, and its professors held in the highest esteem. For what? Why, veterinary services on co-operative principles! How far this is just to the Metropolitan practitioners I will leave your readers to decide; but surely more than this should be expected from a scientific institution—the Royal Veterinary College of England (for there is none other). The amount of business and trade should not be the gauge, but the amount of useful scientific and practical knowledge sent forth from its portals into the world—sound scientific research, printed and published for the good of mankind." My closing remarks are: "I trust no more splenetic remarks may emanate anent the St. Pancras School, but that as time rolls on reforms may develop, and the stipends of the professors improve, so that they may work within the college walls only, and in the cause of science; that all out-door practice shall be left to the practitioners (its former pupils) to whom it justly belongs and shall look up to their *alma mater* as their friend and not their foe, snatching from them their bread of life." "Junius" advocates the formation of a Veterinary Medical Board, and the sequel of these meetings may be the formation of such a board; there can be no doubt it would be very advantageous to us.

Well, gentlemen, so far as writing has gone, no advantage has arisen, and unless the members of the profession stir themselves up (hear, hear) nothing is likely to be done. The Governors of the College are a body of gentlemen who are doubtless willing to advance the interests of the profession; and should a deputation wait upon them, I am sure they will grant the practitioners a fair hearing. (Hear, hear.) I must say that it would have been far more satisfactory had the Principal of the College brought this matter forward to their consideration without this pressure. (Hear, hear.) We need not touch upon any subjects, than those which affect the interests of the practitioners direct, and the following points might be laid before the Governors for consideration, viz. :—

1st. The insignificant fees charged for the professors' knowledge, skill, and influential opinion to the subscribers.

2nd. The out-door practice carried on by the professors, contrary to the College rules and regulations as published. Horses being examined outside the College walls continually, and nearly all the important public exhibitions or shows being under their private control as well.

When the College was in infantile life, it was doubtless necessary to adopt measures likely to obtain public notice, and patients for the new innovation; but now, in its adult life, the public do recognize its worth, and are ready to appraise it. But when the Governors permit so slender a value to be fixed on a professor's skill, at what value will the public estimate their qualified pupils? The fees of these pupils have been raised some ninety per cent.; why should not the other fees be raised in like proportion?

The public gauge the fees of the newly-fledged graduate by these paltry College charges; surely, if higher education and fees be demanded from the

pupils, a commensurate return should be offered them by the *alma mater.* Moreover, by raising the College tariff to its subscribers, the Governors may be able to make the stipends of the professor's sufficient, so that they may deliver up the various lucrative private appointments and practice wrested from the metropolitan practitioners, by virtue of their "titular" distinction, which, unfortunately for the graduates, gives them public precedence. The stipends of each professor being made on an equality with his professional education and skill would prove an incentive to scientific study and research —the lawful occupation of a professor—and conducive to the welfare of the institution and the profession, a far more satisfactory state of things than exists at present, whereby we have the taught thrust aside in the battle of life by the teacher, who takes the only chance an industrious, well-informed practitioner needs in the public duties of a profession. If the professors refused the public appointments, or were not allowed to practice outside the institution, as by rules enacted by the Governors, then the graduates would have fair play, and, in the end, the profession and professors have interest in common. The welfare and advancement of the profession and the schools would be promoted, and probably fewer students would be so frequently rejected. The notice of the Governors should be directed to the *fact* that the subscribers to the college are mostly men of wealth and position—large companies and firms—able, though not willing, to pay fair fees. The system does not exist for the poor and needy, or for the student's advantage of practice, for higher fees would not deter the opulent from seeking the opinion or skill of a learned professor, and it it is most probable that as soon as the general public knew the professors were always to be found within the college boundary there would be more cattle practice, which is so much needed there. With reference to the financial position of the College adverted to by Mr. T. Moore, I think we have nothing to do with that. I think the guinea fee for examining is a fair one, and it should be general. The other day I was shown a receipt by a West-end member for 10s. 6d., for examining a horse. Mr. Rowe's experiences are those of every member of the profession in London, as he states; and I think what Mr Price has told us about the hospital surgeon being sent for 5s. and 1s., bus fare, is preposterous, and deserves to be exposed. I agree with Mr. Rogers as to sending a deputation to the Governors, but think we had better hold another meeting first, when I hope to see the professors and a few of the Governors, so that the subject may be fairly discussed.

Mr. J. MOORE: I agree with our chairman when he says the Principal of the College ought to have been the first to introduce the reforms we are seeking. I am afraid we are not likely to get much help in that quarter, for I well remember what occurred at the time the College sought a charter. I was on the Council at the time, and so was the Principal; but he never said a word about the matter, and it was a mere chance it eked out. The effect would have been to give the St. Pancras School the right of granting its own diplomas, and causing a split in the profession. This was not by any means compatible with the College boasts about what it had done to improve and cement good fellowship. I think the Governors acted as gentlemen in omitting the objectionable clauses, after hearing what the Royal College of Veterinary Surgeons had to urge against them. We have three members of the profession among the Governors, and we must look to them for assistance. I think it would be a good thing to form a society to look after our political interests. It need not be a trades' union.

Mr. ROWE: I will point out that the three gentlemen on the Board of Governors, Sir F. Fitzwygram, Mr. Harpley, and Mr. Collins, are all army men who have little in common with us, and do not feel the competition. No one will "bell the cat." Some have a personal feeling in the matter, and many have held aloof from this meeting, although they know in their hearts

they would be the first to profit by any alterations made through its instrumentality.

The CHAIRMAN: I think it would be better if the practitioners bound themselves together, so that they might be fairly represented on the Council of the Royal College of Veterinary Surgeons. I think also that it should be laid down that no professor, or at least no Principal, should be elected President. In the present instance, we cannot ask the President to assist us either by his presence or advice, he being the Principal of a Scotch School. A President should be a man who has made his mark in the ordinary exercise of his profession; two or three such men, associated with the army men as Governors of the Royal Veterinary College, would tend to mend matters very materially. Mr. Price hopes Mr. Fleming will attend any future meeting. I am sure we all have that hope, and I think he would have been here to-night had he been in London; but we all know we cannot ascribe his absence to his want of interest in matters affecting the professional welfare. I see some gentlemen here who have come many miles to attend this meeting, and as the hour is late I propose that the meeting be further adjourned to some date to be duly announced; and that in the meantime the Council of the Royal College of Veterinary Surgeons be asked to kindly allow us to meet in their Council Chamber.

The proposition having been put was carried unanimously, and the meeting accordingly adjourned.

THOMAS MOORE, *Hon. Sec., pro tem.*

PATHOLOGICAL SOCIETY OF LONDON.

Pyæmia, Septicæmia, and Purulent Infection.

AT the meeting of this Society on May 20th, the report of the Committee on this subject, which was composed of Drs. Ralfe and Greenfield, and Messrs. McCarthy and Beck, was presented to the Society by Dr. Ralfe, the Secretary to the Committee, who read an abstract of the results that had been arrived at. The report was illustrated by a large number of microscopical specimens. It was divided into three chief divisions. The first contained statistical information as to the occurrence of the diseases in question in the surgical wards of the principal metropolitan hospitals for the last ten years; with careful analyses to ascertain whether any connection could be traced between their occurrence and the state of the weather, etc. It was remarked that the great want of uniformity in the mode of drawing up the hospital reports had been a serious hindrance to the compilation of this part of the report. The second division contained detailed accounts of 156 cases, classified according to their clinical and pathological features, with a view to ascertain how far the diseases in man corresponded with morbid states of a similar nature produced experimentally in animals. In the third division, a description was given of a large number of microscopical specimens of various organs taken from typical cases, together with observations on the blood and urine. Some of the microscopical specimens had been made before the death of the patients, with a view to illustrate the nature of the pathological changes in different stages of the diseases. In the second division of the report, details were given of twenty-nine cases of septicæmia, and of 127 of pyæmia. The cases of septicæmia were further divided into septic intoxication and septic infection. Under the term septic intoxication were included those cases where the dose of septic poison was so great as to kill the patient within a few hours of its absorption. This did not appear to be a common occurrence in man, only two cases being included in the report. For its occurrence, there must be a large quantity of septic material in the wound, and this material must be rapidly absorbed. These

conditions were rarely present, and, therefore, if septic intoxication in any way comparable to that produced in animals ever occurred in man, it must be in cases where there was a large wound, which, from its situation or shape, was difficult to drain; the most favourable conditions being the presence of septic material in a serous cavity, as in the peritoneum after ovariotomy, or in wounds of large joints. The symptoms in such cases came on about one day after the production of the wound, when decomposition had thoroughly set in, unless special means had been taken to prevent it. Under the other division, headed septic infection, were included cases of septic poisoning without metastatic inflammation—common septicæmia, it fact. In this disease, there was a true infective process. The poison, when absorbed, multiplied in the organism, and the blood of the animal so infected had, by inoculation, started a similar condition in another animal. The effects of the poison were not proportionate to the dose; and the development of the disease was slower, and the duration longer, than in septic intoxication. The evidence to prove the existence of the disease in the human subject must be looked for in the following directions, viz., the existence of a wound of such a size as to make a fatal dose impossible; evidence of infection from one patient to another; and the presence of organisms in the blood during life or immediately after death. The 127 cases of pyæmia were divided into eight groups, viz.: 1. Cases where there was no evidence that the secondary inflammations were due in any way to embolism; and these again were subdivided into (*a*) Cases where visceral disease was absent, and, (*b*) Cases where visceral abscesses were present, but where there was no evidence of thrombosis or of softening clot to be found: 2. Cases where thrombosis had occurred, but where it was apparently due to the condition of the blood: 3. Cases where there were thrombosis, softening of the thrombus, and secondary abscesses in other viscera, but not in the lungs: 4. Cases where there were venous thrombosis and softening of the thrombus, with secondary abscesses in the lungs, and in other viscera or tissues: 5. Cases in which there were venous thrombosis and softening of clots, with embolic abscesses in the lungs only: 6. Cases where there were thrombosis and softening of clots without any embolism: 7. Cases of pyæmia secondary to acute necrosis of children: 8. Cases of pyæmia secondary to endo- or myo-carditis. The third part of the report contained a series of observations upon the blood and urine in three diseases. The blood had been examined in eighteen cases of pyæmia and septicæmia; and bacteria had been found in most, though not in all of the cases. Six forms of bacteria were met with; 1. simple jointed filaments; 2. ovoid bodies; 3. large spherical bodies; 4. dumb-bell bacteria; 5. rod-shaped bacteria; 6. protoplasmic masses, corresponding to large micrococci in size and appearance. This latter variety was met with in one case only; the dumb-bell variety was also only seen in one case. In five cases, the bacteria presented a great variety of forms; in three cases, the form of the bacteria was not noted; in the rest, there were globular forms occurring in pairs and chains, associated with very minute or ordinary rod-shaped bacteria. It would thus appear that, so far as observations went, there was no one form of bacterium peculiar to any one form of septic disease. The white blood-corpuscles were found to be increased both relatively and absolutely, but in very varying degrees in different cases, and at different periods of the disease; the variations were not found to coincide with any change in the temperature or with any definite symptoms. In one case, the lowest proportion followed the occurrence of repeated rigors. In the examination of the urine, no special chemical characteristics were noted, except such as are observed in other acute forms of pyrexia. The organic solids were slightly increased, the inorganic solids somewhat diminished, chiefly as regards the earthy phosphates; it was possible that the diminution in the

inorganic constituents was due to the diminished ingestion of food, or even to the retention of some of the waste material in the blood to serve for the nutrition of the organisms. The potash, which, it had been suggested, might be increased in consequence of the destruction of the red blood-corpuscles, was found to be below the normal average. The report concluded with an account of a large number of microscopical examinations of the various organs. In a great number of the cases, micrococci were found in most of the organs. These micrococci were always situated in the blood-vessels, being chiefly in the capillaries. In the capillaries, they completely blocked the vessel, and in some instances the vessel appeared to be ruptured or partly absorbed, so that the micrococci were seen to be extruded for some distance into the contiguous tissues. In the large vessels, they formed a layer of uniform thickness, lining the walls. Their distribution in the different organs was very unequal. Bacteria were found in two cases only, in both of which they occurred in the rod-shaped form. In one case, they occurred in a glomerulus of the kidney; but it must be mentioned that in this case the epithelium of the kidney was much decomposed. In the other case, rod-shaped bodies were met with in the heart of a patient with myositis; in this case, the *post-mortem* examination was made very soon after death, and hence the presence of bacteria could not be due to decomposition. It was possible that some change in the chemical composition of the tissues of an organ might be necessary for the growth and multiplication of these different organisms, and that this change was induced by the pyæmic poison. If this were so, the presence of these organisms must be looked upon as an evidence rather than as a cause of pyæmia. In almost all cases, changes were found in the blood-vessels. As a rule, the epithelioid membrane was detached to a greater or less extent. In some places, the detachment had taken place *en masse*. In a good many cases, the deeper layers of the intima were hypertrophied, producing a diminution in the lumen of the vessels, apparently due to obliterative endarteritis. Sometimes this hypertrophy was followed by degeneration, a condition which was especially seen in the glomeruli of the kidney. In some cases, the external coat was hypertrophied, and this, again, was frequently degenerated like the intima. These changes were not found in the venules, although thrombi were very common in them. No special changes were found in the walls of the larger veins, except such as were associated with inflammation in the surrounding tissues. The thrombi in the veins and venules were mainly composed of leucocytes and fibrin; sometimes the entire channel being thus blocked; but in some cases, a passage was left patent on one side. Occasionally, minute abscesses were met with, connected with, and apparently dependent upon, the thrombi.

The PRESIDENT, in proposing a vote of thanks to the members of the Committee who had drawn up the report, stated that the appointment of the Committee to investigate the subject was due to the initiative of the late lamented Dr. Murchison; and it was through his efforts that the grant had been obtained from the Government, without which it would have been much more difficult to carry out the investigations. It was not in accordance with the rules of the Society to permit any discussion on the report, which would, however, be printed *in extenso* in the *Transactions*. There could be only one opinion as to the great value of the report, which, without any doubt, will have greatly added to our knowledge of the subject.

Three Varieties of Skin-disease in the Horse.

Dr. THIN, on behalf of Mr. FLEMING, 2nd Life Guards, read some notes on three cases of skin-disease in the horse. The first was a case of multiple sebaceous tumours, varying in size from a pin's head to a bean. They were encapsulated, the capsules being lined with flattened epithelial cells. The

second case appeared to be one of *erythema circumscriptum*. The disease had begun with suppuration of the submaxillary glands, which had greatly prostrated the animal. This was followed by the appearance of discoid elevations, varying in size from a sixpenny-piece to a florin, in various parts of the body. The margin of these swellings was raised and hard. Microscopically they were found to consist mainly of serous effusion, with scanty infiltration of leucocytes; and they would appear to have been due either to pressure on a limited area, or to some local injury to the blood-vessels of the patch. He would suggest that some poison had been absorbed by the blood, which had made its way into the walls of the blood-vessels, bringing about the effusion. The third case was one which he had at first thought to be Eczema, for the name was fully warranted by the symptoms, the eruption being attended by itching and a gummy discharge. Microscopically, however, it was found not to be of that nature. There was destruction of the sebaceous glands, the hairs having fallen out. In the deeper layers of the epidermis were minute abscesses, such as may be met with in the skin of a horse suffering from tinea tonsurans. There was no cell-infiltration, no swelling of the bundles of connective tissue, nor any serous infiltration, as in Eczema. Hence the disease was not Eczema, and, not being a perifollicular disease, it could not be called Acne.

The PRESIDENT stated that he was familiar with the condition described, and had seen it in connection with a gall on a horse's back. He had thought it to be an Eczema. This animal had had two attacks.

SCOTTISH METROPOLITAN VETERINARY MEDICAL ASSOCIATION.

THE quarterly meeting of this Association was held in the London Hotel, Edinburgh, on the 4th June. The President, Mr. Rutherford, Edinburgh, occupied the chair, and there was a fair attendance of members. A motion by the President, that the Association subscribe annually the sum of one guinea to the Scottish Society for the Prevention of Cruelty to Animals, was carried unanimously. The President gave notice of a motion, recording the satisfaction with which the Association viewed the agreement recently concluded between the Highland and Agricultural Society and the Royal College of Veterinary Surgeons—an agreement calculated to lead to the complete unity of the profession.

Professor WALLEY exhibited a beautiful stuffed calf, with two fully-formed and distinct heads and necks, a double spine, and two tails. The fœtus had been forwarded to him by Mr. Taylor, Seaford, Co. Down, and he had it stuffed for the college museum. The fœtus being of a fair size, the two heads offered a serious obstacle to delivery, but this Mr. Taylor had effected without mutilating the calf, and the cow afterwards did well.

Professor WALLEY also submitted for the inspection of members, several other pathological specimens, including the head of a goat affected with osteo-porosis, and the cæcal tubes of a fowl, in the walls of which were embedded nematode worms. Mr. Dacre, of Manchester, who was present as a visitor, showed the proximal extremity of the radius and ulna of a heifer which had suffered from sudden and excessive lameness of the elbow joint. The lameness was not traceable to any external injury. After death the articular surface of the radius was found to be extensively diseased, the articular cartilage and underlying compact tissue being in places removed and the cancellated tissue exposed. The subject had been of a scrofulous constitution, and Mr. Dacre thought the arthritic disease was of that nature.

Mr. REID stated that for the past nine years, during which period he had been inspector at Leith, the burgh had never been free from Pleuro-pneu-

monia. He was now, however, able to report that there was not a case within the bounds, nor had there been one for fifty-six days. This very satisfactory state of things he attributed chiefly to the practice of inoculation, which had recently been carried out by Mr. Rutherford. Professor Walley, while inclined to give considerable credit to inoculation, thought the result was in great measure due to the operation of the new Contagious Disease (Animals) Act, which was preventing the introduction of new cases from without.

Mr. ROBERTSON, Kelso, in continuation of a paper read by him at a previous meeting, made the following remarks on the subject of Arthritic or Joint Disease in young animals :—"Having in my former appearances before you, entered somewhat in detail into the Morbid Anatomy and Pathology of Arthritic Disease in young animals, I had intended at this time more particularly to have directed your attention to its probable *Etiology*, examining in detail those various causes which observation and experiment seem to indicate as operating in its production. This, however, I will not now attempt ; but endeavour in few words to bring the subject to a conclusion at this time. I fear I have been somewhat tedious, and have prevented you from considering other matters at least equally important and interesting. If I have not given you aught new on the subject, or propounded any startling theory in connection with it, I have at least the satisfaction of having accomplished one great object, that of bringing this disease under the notice of this Society, there to obtain what facts and information others may possess who have encountered it in some of our animals.

"In previously remarking on the subject of Arthritic disease, notice was taken of its more extensive distribution and virulent form of development in all our domestic animals at the present time, than what appears to have been the case in the early part of the present century, or the latter part of last. I would also desire that you remember that it is chiefly in all these animals—horses, cattle, and sheep—a disease of the superior varieties, or it may be of any variety when bred and reared under markedly artificial conditions of existence, and that it rarely appears amongst our more primitive breeds, unless these are largely manipulated and interfered with, with a view to their rapidity or perfection of development; that when appearing amongst a number of animals—calves or lambs—it rarely attacks isolated individuals, but rather assumes the enzootic form. Further, that when appearing among stocks, particularly sheep, we observe that the dams are very generally serious sufferers from some markedly systemic disorder.

"Although not ignoring the fact, that both the *Rheumatic* and *Scrofulous diathesis* may, in cases, act as sources from whence spring the varied phenomena presented during the development of certain forms of arthritic disease, nor yet that *Umbilical thrombosis* and disseminated abscesses are very generally accompanying features of the most virulent and largely distributed outbreaks of this malady, I am, nevertheless, rather inclined to the belief that there seems evidence sufficient to convince me that these conditions of structural changes, in connection with the articulations, that the omphalo-phlebitis and general pyæmic condition, may be most satisfactorily regarded as simply the outcome or development of a condition of fœtal mal-nutrition. The causes, whatever these may be, are *ante* not *post* parturient ; they must be looked for not as operating on the young animal after birth, but as those which influence its development during intra-uterine life. Inflammation of the umbilicus and umbilical vessels is, undoubtedly, a very prominent and early feature in all serious outbreaks of the disease. But this condition of these parts of the circulatory apparatus in these young creatures—foals, calves, and lambs—I most strenuously maintain is not solely or chiefly the result of inoculation with filth or septic matter through the

medium and because of the open umbilicus. During intra-uterine life we have the conditions of purulent omphalo-phlebitis, and particular and general thrombosis with disseminated abscesses. The animals are born with omphalitis well developed, and how can any amount of care, which the German pathologists so much insist upon, bestowed on the navel of the newly-born domesticated animal, or any attention to sanitary conditions, prevent a condition of things which already exists.

"Again, it is contended by those who object to its dietetic origin, that the strong as well as the weak are sufferers, and that it appears independent of the nature of the food of the parents. I am satisfied that it will appear in stocks on almost every variety of food. It is not the particular kind of food, so much, as its modes of administration, or the manner in which the animals are fed in relation to other circumstances and conditions. If you carefully analyze the different outbreaks with which you may be familiar, you will find that this arthritic disease seems to appear as the sequel to every or any condition and combination of conditions which tend to the production of animal tissues and elemental structures imperfectly elaborated or developed.

"The more I consider the matter, and the more I have to advise regarding the rearing of our young animals, the more am I convinced that the best of our stock animals, male and female—particularly the former, in those varieties of the several classes which by general consent are regarded as the most highly developed and improved—are, in much pertaining to their constitutional vigour, as well as powers of procreation, greatly impaired, and, in many instances, irreparably damaged by the system of dietary to which they are subjected in order that they may make a good appearance in the show-yard.

"No, Mr. Chairman and gentlemen, the pampering and forcing, the unnatural stimulation so much in fashion, will give us fat animals, but certainly it is not calculated to give us the most healthy and well developed animals, capable of transmitting to their progeny those qualities in the highest degree of perfection for which the variety may be particularly admired. It is a common remark by more skilled observers, when admiring in the show-yard our over-fed stock animals, that they seem very soft. This is critically and scientifically correct to an extent that they who make it little imagine ; for not only are the tissues of these animals marked by a want of tonicity and perfection of development, but we find that their progeny in fœtal life are characterised by similar features. In numerous instances the embryonic cells seem incapable of progress beyond a certain point, their protoplasmic contents, instead of undergoing progress in development, take on degenerative changes, and instead of consolidation in texture, the obvious condition is softening and liquefaction. Depend upon it, gentlemen, it will be of comparatively little benefit—all our treatment, even the prevention as applied simply to the young—so long as we allow the constitutions of the parents to be invalidated.

"I have said nothing as to the curative treatment, when this is attempted, in arthritic disease. I have left this to be taken up in the remarks and discussion which may follow. I will leave the matter in your hands, thanking you for the patience with which you have listened to my somewhat lengthy treatment of this subject, and trust that all who have seen this disease will give us their experience ; for I am satisfied that it is only by a collection of facts and observations, that any real progress can be made in the science of medicine : as also, that the youngest practitioners of any department of the healing art, as long as he adheres closely to these indications, is fully entitled to call in question the deduction or hypothesis of the fathers of his profession."

During the discussion which ensued, the SECRETARY stated that in reply to

an invitation to attend a former meeting, he had received from Mr. Gerrard, Romford, a letter, regretting that distance would not prevent him to be present to hear Mr. Robertson's paper, and at the same time a short communication, embodying his own views and experience of the disease. At the request of the members, the communication was read. The opinions of Mr. Gerrard in the main coincided with those of Mr. Robertson.

The meeting terminated after a hearty vote of thanks to Mr. Robertson, for this and other valuable contributions which he had made to our knowledge of Arthritic Disease in young animals.

JOHN MCFADYEAN, *Secretary.*

YORKSHIRE VETERINARY MEDICAL SOCIETY.

THE spring quarterly meeting was held at the Queen's Hotel, Leeds, on the 29th April, the President, Mr. Peter Walker, in the chair. The following members were also present, viz., Messrs. Naylor, Greaves, Freeman, James Cuthbert, Anderton, J. M. Axe, Lodge, Schofield, W. G. Spillman, G. Carter, Atcherley, J. E. Scriven, Edmondson, J. S. Carter, Pratt, Beeson, Professor Axe, and the Secretary. Messrs. Robertson, V.S., and F. Cuthbert, student, were present as visitors. Apologies for non-attendance were sent by Professor Williams, Messrs. Dray, Bale, Danby, Joseph and John Freeman; also Messrs. Tom Taylor, W. A. Taylor, and other friends.

The minutes of the previous meeting were read and confirmed.

Professor AXE delivered a highly instructive and interesting lecture entitled "Aids to Diagnosis." He regretted exceedingly that circumstances had not permitted him to commit his thoughts to paper, but he trusted he should be sufficiently explicit verbally. The Professor confined himself almost exclusively to elucidating the physical modes of diagnosis, and passed in review the uses of the opthalmoscope, microscope, stethoscope, thermometer, and urinometer. He regretted that Veterinary Surgeons generally had not studied the various uses of these instruments; but he trusted that the remarks which fell from him that afternoon would not fail to raise a spirit of inquiry amongst those present. The opthalmoscope had produced marvellous results in the sister profession, and he anticipated that it would reveal to us the cause of "shying" in horses. By its use we could look into the inmost recesses of the eye; and without the transparent media being at all affected, the instrument would reveal morbid conditions of the optic nerve, and other structures: blood blotches or old clots upon the retina will often be detected in the eyes of shying horses. After expatiating more fully upon the uses of the opthalmoscope, and the patent effects ensuing therefrom, he sincerely hoped his professional brethren would study the uses of this valuable "aid to diagnosis." Since the compound microscope has been invented, it has revolutionized the sciences of zoology, morbid anatomy, chemico-physiology, etc. "You are aware, of course," he said, "that the use of the microscope is now taught at the Veterinary schools, and I may state, *en passant*, that never were there so many available means of disseminating information to the Veterinary pupil as are now given at the schools. By the microscope we detect the parasite infecting the skin; it reveals minute organisms in the blood, and also the *bacillus* of splenic fever. What should we have known as to the existence of germs unless with the aid of this wonderful instrument? Besides revealing organisms existing in the blood and skin, the instrument is also useful to Veterinary Surgeons in determining the true nature of the morbid products existing in the urine, and thus determining whether we have disease of the bladder or kidneys. The thermometer has received more general use than either of the other instruments on account of its simplicity, I presume; still the amount of good derived from its use is infinitely less than from the microscope or opthalmoscope. The thermometer

merely tells you that an animal is ill, and thus acts as an auxiliary to the other sypmtons. The other instruments reveal and bring the disease before your eyes. The stethoscope is much less valuable as an aid to diagnosis in animals than in man. The presence of hair and thick skin prevents the complete transmission of vibration, but the instrument will generally inform us how far disease has progressed, etc., etc. The urinometer shows the state of the urine, in cases of chronic indigestion or liver disease ; where we have defective assimilation the specific gravity of the urine becomes altered, and therefore in these cases the use of the urinometer is beneficial."

In the discussion that followed the lecture, Messrs. Naylor, Greaves, Freeman, and other members took part.

Mr. NAYLOR proposed and Mr. GREAVES seconded a most cordial vote of thanks to Professor Axe, which was carried unanimously.

Mr. BEESON exhibited a parturition hook, the handle partially composed of movable hinge-joints ; also a clamp to seize the ear of the foal or calf, both these instruments being his own invention.

WM. BROUGHTON, *Hon. Sec.*

NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

THE first meeting of this Association was held in the Douglas Hotel, Newcastle-on-Tyne, on May 31st, 1879. Mr. D. DUDGEON, President, in the chair. There were present—Messrs. C. Stephenson, H. and A. Hunter, G. Elptick, J. Gillespie, J. Corbett, W. S. Prengle, W. J. Masters, C. T. Sterten, Dr. Armstrong, Newcastle-on-Tyne ; Mr. D. Macgregor, Bedlington ; Mr. W. Wheatley, S. Shields ; Mr. J. Gofton, N. Shields ; Mr. W. J. Mulvey, Bishop Auckland ; Mr. W. Anderson, Hexham ; Mr. J. Nisbet, Fence Houses ; Professor Williams, Edinburgh ; Messrs. Foreman, Junrs., Leadgate ; A. L. Butters, Sunderland ; C. Hunting, S. Hetton ; and the Secretary.

Letters of apology for non-attendance were received from Professor Pritchard, Messrs. T. Greaves, J. Welsby, D. Hutcheon, J. Storie, J. Meikle, T. Foreman.

The PRESIDENT said he would not trouble the members with an inaugural address, as their time would be far more profitably employed in listening to Professor Williams' paper. He had an intimation to make which would meet with the approval of all present, viz. : That Professor Williams had been elected President of the Royal College of Veterinary Surgeons for the ensuing year. This announcement was received with great applause.

Professor WILLIAMS then read a very able paper on "Splenic Fever and the History of the Bacillus Anthracis," exhibiting microscopic drawings of the Bacillus. At the conclusion of the paper, he thanked the members for the attention they had given him, and also for the hearty manner in which they had received the announcement of his election as President of the Royal College of Veterinary Surgeons, a post which he would endeavour to fill to to the best of his ability. He also informed the members that the next annual meeting of the Royal College of Veterinary Surgeons would be held in Edinburgh ; he referred to the union which had been brought about with the members of the Royal College of Veterinary Surgeons and the Highland Society, a thing which he had long striven for, and which had now been brought to a successful issue, mainly through the indefatigable endeavours of their late President, General Sir F. W. Fitzuygram.

A very animated discussion followed the reading of the paper, in which Messrs. Macgregor, Gofton, Stephenson, H. Hunter, Nisbet, A. Hunter, Mulvey, Elptick, C. Hunting, and Dr. Armstrong took part.

Mr. STEPHENSON proposed, and Mr. H. HUNTER seconded, a vote of thanks to Professor Williams for his kindness in coming and reading them such an instructive paper.

Professor WILLIAMS having replied, the meeting terminated.

Afterwards the members and guests sat down to an excellent dinner, at which all the patriotic and other toasts were ably proposed and responded to, a very enjoyable evening being spent.

G. R. DUDGEON, *Hon. Sec.*

ROYAL AGRICULTURAL SOCIETY.

AT the monthly Council meeting held on June 4th, Colonel KINGSCOTE, C.B., M.P., reported that there were no reports on cases investigated during the last month from the Royal Veterinary College. A letter had been received from Dr. Burdon Sanderson, informing the Committee that owing to Dr. Greenfield not having been able to obtain material for prosecuting experiments on Anthrax, nothing has been carried out in this direction. The Committee recommended that the Metropolitan Board of Works be communicated with in reference to obtaining information relative to outbreaks of disease of animals in the metropolis; and that a copy of the rules and regulations guiding the examinations for prizes and medals for proficiency in cattle pathology be forwarded to the Lord Lieutenant of Ireland and the Secretary of the Highland Society, together with an explanatory letter suggesting that the prizes should be open to students from all parts of the United Kingdom, and inviting their co-operation to carry this into effect. Professor Simonds had reported that experiments were being carried on at the Royal Veterinary College with respect to the disease which is known by the name of Trichinosis.

This report was adopted.

Army Veterinary Department.

WE have much pleasure in announcing that the New Veterinary Warrant has been approved of in full, and will be immediately published in India. It appears that the increase in pay is substantial—the Inspectors receiving about £250 a-year more than at present, the other ranks in proportion. This removes one of the more serious grievances of which complaint has been frequently made in this Journal.

Inspecting Veterinary Surgeon Gudgin has been appointed to the local rank of Principal Veterinary Surgeon while serving in South Africa. This is the first recognition on record, we believe, of the services of the Veterinary profession in the field, and the concession is due to the strong representations of the head of the department, Mr. Collins.

In future, an Army Veterinary Surgeon will be a member of the Board of Survey on all horse-transport ships fitted out in this country.

Veterinary Officers attached to the Royal Artillery and Army Service corps will not in future be gazetted to these corps. Their names are to be borne on the departmental establishment, and they will take their tour of Foreign Service according to their position on the general roster.

Veterinary Surgeon C. W. Gillard, 15th Hussars, is returning home from India to appear before a medical board.

The newly appointed Veterinary Surgeons have been posted as follows for probationary duties:—Messrs. A. W. Mason, Charles Rutherford, Kay Lees, and F. W. Forsdyke to Aldershot; J. T. Dibben, E. W. Goldsmith, and Francis Kennedy to Woolwich; Edmund Day to Canterbury; and A. W. Drake to Colchester.

The *Army and Navy Gazette*, of June 14, has the following notice :—"There will shortly be a vacancy for an Inspecting Veterinary Surgeon by the retirement of Mr. B. C. R. Gardiner, who has attained the prescribed age. On Mr. Gardiner's retirement, Mr. A. J. Owles will, it is understood, leave the head quarters of his department for the district charge at Woolwich, being succeeded by Mr. G. Fleming, from the 2nd Life Guards, who will obtain the rank of Inspecting Veterinary Surgeon. Mr. Fleming's promotion will meet with the general approval of his department, the interests of which he has furthered in a thousand ways."

Parliamentary Intelligence.

House of Lords.—May 29th.

TRICHINOSIS IN AMERICAN PIGS.

The Earl of BELMORE asked the noble Duke the President of the Council whether it was true that swine landed in this country from America had been found to be affected with Trichinosis, and if so whether the Government intended to take any precautions against the introduction of the disease.

The Duke of RICHMOND and GORDON.—In answer to my noble friend, I have to state that in consequence of reports from abroad, a certain portion of swine landed from America in this country were subjected to examination by the proper officers of the Veterinary Department, and I regret to say that the result has been the discovery of Trichinosis in some of the animals. The investigations are being continued, and therefore I am unable to state what steps, if any, it may be necessary to take in the matter. I would remind my noble friend that swine coming from America are killed at the port of landing. I am glad that my noble friend has put the question, because it enables me to caution the public in the matter, and to mention that the best precaution against this complaint—so dire of its effects to the human species—is that all portions of the swine, ham, pork, and bacon should be thoroughly well cooked before they are made use of (hear, hear, and laughter).

Obituary.

THE registrar of the Royal College of Veterinary Surgeons has reported the following deaths among members of the profession :—

James Maxwell, Thornhill, Dumfriesshire,	who graduated in	1835.
G. W. Cooke, Ingham, Lincolnshire,	"	1867.
J. Tilsley, Tregynow, Montgomeryshire,	"	1861.
J. Turner, Sheffield,	"	1851.
P. McKenzie, Cargill, Perthshire,	"	
J. K. Haire, Jersey,	"	1859.

Mr. Haire was in his earlier years brought up to the law, but fancying the veterinary profession he entered its ranks, and after graduating went to St. Helier's, Jersey, and entered on practice. He probably soon found that his college education alone would not suffice to enable him to succeed in his career, and that lacking clinical knowledge and experience, he must acquire these at painful expense of time, patience, and even reputation. However, this may be, he at any rate early commenced a livery and posting business, and is credited with having been the first to organise a system of excursion cars to run round the island. He was also the first Englishman elected to the post of Centenier, and the only one who has ever sat in the States Assembly. He held the office of Veterinary Surgeon to the R. M. Artillery.

Jurisprudence.

THE KNOWLEDGE OF PIG DISEASES IN THE MEDICAL PROFESSION.

ON May 3rd, at the Bilston Police Court, before W. H. Rogers and S. Loveridge, Esqrs., Jabez Stanley, butcher, Can Lane, Sedgley, was summoned under the Bilston Improvement Act, by Mr. J. D. Wassell (clerk to the Board of Commissioners), for being in possession of, and exposing for sale in Bilston Market, twenty-eight pieces of pork which were in an unsound state, and unfit for human food.

Mr. E. H. Thorne appeared for the defence.

Inspector Evans stated that on the afternoon of Monday, the 21st of April, from information he received, he went, in company with Mr. W. M. Hancox, the medical officer of health, and P. C. Smith, into the Bilston Market, and there saw on defendant's stall, which was in charge of a servant, twenty-eight large pieces and sundry small pieces of pork, which was shown to Dr. Hancox, and afterwards seized by witness, and the whole destroyed by order of Dr. Best. From the appearance of the pork witness should say it was diseased, as it appeared to be measled.—Cross-examined by Mr. Thorne: Had known defendant for some time, and had never known anything against him previously.

Mr. W. M. Hancox, medical officer of health for the township, said on the date in question he inspected twenty-eight pieces of pork, which he found to be in a measly condition, and as such was diseased. It was a febrile disease which would permeate the whole system of the animal, and consequently the flesh would be unfit for human food. Witness condemned the pork as such.—Mr. Loveridge: Was it tainted at all?—Witness: It was covered with rusty blood looking spots all over the surface.—Mr. Hall (magistrates' clerk): Was it decomposed?—Witness: It was not decomposed, but Mr. Best also saw it and agreed with me that it was unfit for human food.—Mr. Thorne: What sort of disease is the measles?—Witness: I consider it a febrile disease which permeates the whole system, and determines itself upon the surface, showing itself by spots.—Mr. Thorne: That sounds a very professional description.—Witness: It is right.—Mr. Thorne: Is it the same in pigs as human beings?—Witness: Analogous, I believe. I am disposed to think it would be the same in pigs as in human beings.—Mr. Thorne: Don't you know that measles in pigs are never the same sort as in human beings?—Witness: It is a disease as much in the pig as in the human subject.—Mr. Thorne: Is it the same sort of disease?—Witness: There may be some modifications owing to the structure of the animal.—Mr. Hall:—I suppose you have not attended pigs in disease?—Witness: No I have not. (Laughter.)—Mr. Rogers: You are not a pig doctor?—Witness: No I am not. (Renewed laughter.)—In further cross-examination, witness said he was quite satisfied that the meat was diseased, and as such was unfit for human food. He had never observed the same appearance in healthy pork. Could not tell whether it was English or American pork; it might be Irish for all he knew. Did not know that a disinfectant was used upon pigs coming from abroad, and that it produced a strange superficial appearance to the skin, and that, notwithstanding, the pork might be healthy. He did not believe any disinfectant could be applied to make it present the appearance it did. Dr. Best cut into one of the legs, and it appeared to be very flabby.

The Bench pointed out that it was immaterial whether the pork was measled or otherwise, so long as it was unfit for human food, as stated by the medical officer.

Mr. Thorne addressed the Bench for the defence, contending that Dr.

Hancox was altogether mistaken when he said the pork was unfit for human food. He said he should prove that the pieces seized were portions of two American pigs purchased by defendant from Messrs. Davis, of Wolverhampton, at market price, that they were killed at the Wolverhampton Corporation slaughterhouse through being merely distressed and not diseased, and that they were passed by the market inspector, who saw them twice after they were killed.

Mr. Dawson, inspector of the Wolverhampton Cattle and Pig Market, was called, and stated that there was a slaughterhouse belonging to the Corporation provided near the market to slaughter distressed beasts. On the 16th of April witnessed inspected nine pigs there, and condemned five of them and ordered them to be destroyed. There were there, amongst others, two slaughtered pigs belonging to defendant, which in his opinion were quite fit for human food; £7 would be a fair price for the two. Measles in pork arose from *animalculæ* in the lean of the meat, something like rice in appearance. Pigs imported from America and Ireland were continually disinfected whilst on board the vessels, and the result was to make the surface of their skin appear scalded, and leave red spots upon them.—Mr. Rogers: Do you say anything of the bacon?—Witness: I don't know anything about the bacon. I am speaking about the pigs as green pork. He considered that the five pigs he condemned for slaughter were "typhoid pigs." They had nothing of the same appearance as the two belonging to defendant.

After a short discussion between the Bench, Mr. Thorne and Mr. Hancox, William Evans, a slaughterer at the Wolverhampton Corporation slaughterhouse, was called and said he remembered two pigs being bought by defendant, and examined by Mr. Dawson, the inspector, who passed them. Witness dressed the pigs, which were not diseased, but a little spotted, that being caused he believed, by their having been overheated in the railway trucks, and by the disinfectants which were put into the trucks. Saw defendant purchase the pigs and give £7 for them, that being a good price. The market inspector also saw the pigs on the 17th of April, and again passed them. A salted ham was here produced and shown to the witness, who, although being cautioned by the Bench to be careful, positively identified it as belonging to one of the two pigs in question.

Dr. Hancox, looking at the ham, said it was a third larger than those seized. He also urged that the pieces of meat seized were portions of one pig only, and that the two hams had already been destroyed. How, he asked, could a pig have three hams? (Laughter.)

The witness Evans being questioned by the Bench as to why he a second time called the market inspector's attention to the pigs, reluctantly admitted that it was because he had a little doubt about them.

Levi Carrier, of Sedgley, a slaughterer in the employ of the defendant, said he considered the pigs were all right, and had eaten some of the pork. He admitted in cross-examination by Inspector Evans that when the meat was taken before Dr. Best, he (witness) cut into one of the legs of pork, and drew from Dr. Best the remark that "by doing so he had not mended his case."

Mr. Thorne intimated that this was as far as he could carry the case today, as he proposed to call a veterinary surgeon to give evidence as to the state of the pigs and the quality of the pork, &c.

The magistrates then retired with their clerk to their private room. Upon their return into Court, Mr. Rogers said they had given the case their consideration, and would grant an adjournment, if Mr. Thorne wished it, for a fortnight. He was sorry an earlier date could not be fixed, but he was going away and should not be able to be present until then.

Mr. Thorne acquiesced in this, but remarked that in the Wolverhampton

Borough Police Court it was the invariable practice in similar cases to call in a veterinary surgeon to tender evidence on the point.

Chief Superintendent M'Crea said under the Bilston Improvement Act it was only necessary to have meat condemned by the medical officer of health, and afterwards destroyed. In this case they had double security, the medical officer being backed up by the evidence of Dr. Best.

The case was then adjourned to that day fortnight.

On May 17th, Mr. Thorne intimated to the Bench that his object in now calling a veterinary surgeon to give evidence was to prove the quality of the ham produced in court on the last occasion, and also to speak as to the appearance of diseased meat.

Jabez Stanley, a son of the defendant, and who assists him in his business as a butcher, was called, and spoke to examining the carcases of the pigs after they were brought to Bilston Market, and finding nothing wrong with them, except that they were marked on the surface of the skin with red specks, the result of being overheated. Witness sold a portion of the pork in Bilston Market on the Saturday night following, without hearing any complaints made by the purchasers or the police, but on the Monday after, when he again attended the market with the unsold pieces, they were immediately seized as soon as he had unpacked them. The ham produced in court on the last occasion belonged to one of the two pigs.

Frederick Darley, in the employ of Messrs. Davies and Co., of Wolverhampton, from whom the pigs were purchased, spoke to the sale of the pigs to defendant at a fair price, viz., £7, at which time there was nothing the matter with them.

Mr. J. W. Hill, F.R.C.V.S., of the firm of Cartwright and Hill, Veterinary Surgeons, Wolverhampton, was then called to give the result of his examination of the ham produced in court on the last occasion, when defendant was examined. He said: On the 2nd of May I inspected a recently cured ham at the request of the defendant, and which was alleged by him to have been condemned by the medical officer, on the ground that it was measley. In the rind or skin of the ham I observed several isolated spots, which I carefully examined with a powerful magnifying glass, and also under the microscope after dissecting them out. These spots I found were due to capillary congestion, and were quite superficial in character, none of them extending beyond the skin. In my opinion they were caused either by an external irritant or from suspended circulation in the extremities of the blood vessels, from exposure to cold, most probably the former. The ham when cut in various places, presented no appearance of measles or any other disease; the muscle was firm in texture, healthy in colour, allowing for the change produced by salting, and sweet. The skin spots could not be associated with measles, as no such rash ever exists. The measle of the pig is a parasite, found imbedded between the muscles, and not on the skin, and does not bear the least analogy to human measles, which is essentially febrile disease due to absorption of poison into the blood. It is also, contrary to the pig measle, *non parasitic* and highly infectious. Any supposition that it was typhoid eruption may also be abandoned, from the character of the spots and flesh. The former would have been more diffused, confluent and extensive, devoid of bristles, and marks of ulceration or desquamation would be apparent; the spots would also be most abundant on the inside of the thigh, and not confined to the outside as in this case, while the flesh would have been flabbier, much darker in colour, and have quickly decomposed.

Mr. Hancox, the medical officer of health, said the ham examined by Mr. Hill certainly never belonged to the carcase of the pig he condemned.

Mr. Hill, in reply to Mr. Thorne, said he had had considerable experience in pig diseases, and had written a treatise on the subject of diseased meat.

If there were any febrile indication it would permeate the whole system. He knew that red spots were produced on the skin of pigs by disinfectants, and any one who was not experienced might mistake the spots for disease. The ham he examined was perfectly sweet, and the spots did not extend deeper than the cuticle, in fact only a little way into it.

Mr. Rogers said there was no proof that it was one of the identical hams. He had received a letter from Dr. Best, who ordered the meat to be destroyed, upon the subject, with his authority to make it public if he liked. Mr. Best was himself unable to be present, or would have been there to give evidence.

Mr. Thorne: If he were I should be prepared to cross-examine him and show that doctors might be mistaken.

Mr. Hancox again reiterated that the ham examined by Mr. Hill never belonged to the carcase he condemned, but to a much larger animal. The ham produced in court a fortnight ago was sound enough, and he was able to substantiate that as well as Mr. Hill.

Mr. Hill: I understand the whole of the pork was condemned for this spotted appearance: an external rash is not an indication of pig measle, the flesh of such an animal when cut has the appearance of being studded with rice.

Mr. Thorne having had Mr. Best's letter handed to him by Mr. Rogers, read it. It stated "that the pork when examined by him (Mr. Best) was in the condition commonly termed 'measley,' and the animal had probably died of disease. The case was a bad one, it being well known that the use of such meat for human food was highly dangerous, the disease being caused by interspersion of the eggs of *animalculæ* of a species of tape-worm throughout the tissues of the animal, and which, despite all ordinary cooking, would be communicable, and perhaps fatal to the persons eating it."

After a rather warm argument which followed between Mr. Thorne and the Bench, the former contending that the appearances described by Drs. Best and Hancox being not those of measles, no conviction should follow,

The Bench consulted, and Mr. Rogers said they had given the case the best consideration they could. They may be wrong in their decision, but did not think they were, and as defendant had previously well conducted his business, they did not wish to press a very heavy fine, but wanted it to go forth that these kind of cases could not go on with impunity, and that people were not to be poisoned by eating bad meat. Under the circumstances, therefore, defendant would be fined £5 and costs, or in default one month's imprisonment.

The fine was paid.

Notes and News.

CLIMATE AND DISEASES IN ZULULAND.—From a paper recently read before the Royal Geographical Society by the Rev. G. Blencowe, we extract he following: "The climate of the north-western part of Zululand is salubrious, and in no way injurious to the health of man or beast. The only disease against which care needs to be taken is the peculiar inflammation of the lungs in horses, which is known as horse-sickness. But this is avoided by keeping them in the stable till the dew is off the grass. Lung-sickness has ravaged the Zulu herds, as well as those of the neighbouring colonies, but it is rather an epidemic of occasional occurrence than a permanent disease of the country. For many years it has only existed in the Zulu country as the effect of contagion. The coast districts, from the higher general temperature and the greater abundance of moisture, are not so favourable to robust health as the higher inland parts."

MORE AMERICAN PIRACY.—The dishonesty which has long stained the reputation of American booksellers, who seldom lose an opportunity of seizing upon any English book and issuing it in the United States, without the permission of either author or publisher, who are thereby robbed of their property in the most barefaced manner, is again exemplified in the case of Fleming's "Veterinary Obstetrics." Mr. A. Cogswell, 24, Bond Street, New York, is the culprit this time, and he advertises as follows: "This work is one of the most valuable text books on veterinary science published, and the publisher, in issuing an American edition, has made an exact reprint of the latest London edition, including 212 illustrations, while the price has been reduced to one-half that of the English publication." The morality of Yankee publishers has yet to be discovered; it is certainly not to be found in their business transactions.

ALFORT VETERINARY SCHOOL.—The French Government evidently does not believe that the Veterinary Schools are benefited by allowing the teachers to die in harness—or, rather, to succumb to senile degeneration while yet they are teachers. First, M. Rey was retired from the directorship of the Lyons School, then Lafosse from Toulouse, and now Reynal retires from the Alfort School. Their posts are filled by comparatively young men, who have abundantly proved that their cranial sutures were not prematurely ossified. Chauveau is director of the Lyons School, Baillet of the Toulouse School, and Goubaux, the *pro tem.* director of the Alfort School. All these directors have given ample evidence of their fitness for the functions imposed upon them, not only by the very successful ordeal they underwent before they were appointed teachers, but also by their well-known labours subsequently.

VETERINARY HONOURS.—The *Revue des Cours Scientifiques* mentions that the professors of the Museum of Natural History of Paris, being called upon to nominate candidates for the chair of General Physiology, left vacant by the death of Claude Bernard, placed among the first in the list the name of M. Bouley, of the Institute, Inspector of the Veterinary Schools of France, and one of the most distinguished veterinarians in Europe. Veterinary Surgeon Zundel, of Mulhouse, Alsace, has been decorated with the Order of Stanislaus by the Emperor of Russia, for his writings on Veterinary Sanitary Science and Police. At the jubilee of the University of Copenhagen, Professor Stockfleth, of the Veterinary School, had the degree of Doctor of Medicine conferred upon him, while Professors Bendz and Barfoed were elected Doctors of Natural Science.

Correspondence, etc.

HONEST COMPETITION AT THE LONDON ROYAL VETERINARY COLLEGE, *VERSUS* THE INTERESTS OF THE VETERINARY PROFESSION AND ITS PRACTITIONERS.

To the Editor of the VETERINARY JOURNAL.

DEAR SIR,—A report of the meeting of the members of the Royal College of Veterinary Surgeons, which was held on the evening of Thursday, June 6th, after the Veterinary Medical Society's meeting, will, I doubt not, reach you. In the absence of Mr. E. Coleman, the chairman elect, through indisposition, I was voted to the chair; and although I would have preferred that the duties had fallen to more influential and able hands, still I trust the meeting was so conducted as to bring the subject matter to the very front of the profession, to be thoroughly ventilated and adjusted. The meeting was

adjourned to the evening of that day six weeks, when it is proposed to hold the same (with the sanction of the President), at the Royal College of Veterinary Surgeons, Red Lion Square.

It is to be hoped that every member who has the interests of the profession at heart will be present, and take his part in the discussion ; and also those of the professors who can see the damaging influence the Camden Town School regulations have on the public and the practitioners, so far as the practice of the institution is concerned.

It is rather surprising that after your very able "leader" on this subject, in the November number of the VETERINARY JOURNAL of 1875, four years should elapse before action is taken to redress the wrongs to which the metropolitan practitioners have so patiently submitted for so very many years. Mr. Rowe said at the meeting that it arose from the fact that no one dared venture to "bell the cat." However, now this important duty has been done, I do trust the members will disprove your aspersions on them, in your Journal of August, 1875 (pp. 110 and 111), which says . . . . . "The great majority of the profession keep aloof from aiding in any undertaking, the advantage of which to them, under the present *régime*, they cannot be made to see."

My belief is that they not only *see*, but *feel*, the disadvantages of the present state of things, and the reason for their reticence is a "fear" of the Principal of the St. Pancras School, with a disinclination to mar the happiness of his colleagues in tutorial *togas*, with whom most of us are on terms of friendship and esteem. The position of the Principal of the Royal College at Camden Town, has been, from its foundation, that of "Emperor" in the world of Veterinary Medicine. Heretofore, he has been the dispenser of all favoured "posts," the guide of our "powers," and the "infallible" director of all the concerns of Veterinary Science in England. And who has been to blame for all this—the body of the profession, or its President? My opinion is that the Royal College of Veterinary Surgeons should have come out to the public gaze years ago: the President and his Councilmen being (or should be), the sages of the Art and Science, and take their responsible position as the Directors of Veterinary Science in England, and never permit any School or Teaching College, Principal, or Professor, to direct or dictate. And it is to be hoped that the outcomings of this present movement will develop their responsibility to the profession and the public, and lead to the assumption of their legal duties, rights, and privileges. Previous to the year 1843, the Royal Veterinary College stood alone as the representative institute of Veterinary Science, held all appointments, had all the responsibilities imposed on it, and granted its diploma. In that year the Royal College of Veterinary Surgeons was founded, and for what purpose? Why, the government of the profession, its advancement, and the examination of the students from the schools or colleges that were, or might be, thereafter established, not only in England, but the United Kingdom.

For years after the new foundation, the voice of the various professors of the Royal Veterinary College was heard above all others in council assemblies, and this continued down to almost the present day. Let the Royal College of Veterinary Surgeons take its position upon fair and just grounds, and if those in office now fail to attain the proper status for the college in the professional world, then the profession must, as one body, move it to its pedestal. In Dickens' dictionary, and also in Whittaker's, no mention is made of a Royal College of Veterinary Surgeons, yet we find a Royal College of Surgeons, and a Royal Veterinary College, with its principal and teachers. How is this?

Be all this as it may, now the movement has been started, we must keep *moving*, and *removing* all barriers to progress, and thus be true to ourselves.

The Governors of the Royal Veterinary College having the interest not only of their institution at heart, but the Veterinary Art also, cannot, and I am sure will not, refuse to hear the voice of the practitioners, and will give the deputation a fair hearing. It may however be asked by them, why have we not heard of all this before? The answer is plain. A Field or a Mavor, those born with the College, and a favoured few, cared not for the College and its terms; the Army Veterinary Surgeon was not interested or affected by its terms either; it was only the hardworking, sober, honest, intelligent and needy practitioner who felt the weight. Complain or murmur he dared not, for fear of displeasing his teacher, whose friendship he needed if in a fix with a client. His life (I mean professional, of course) depended on the summing up of the infallible teacher. So, as I have stated, the well to do, established, leading practitioners care not; the Army Veterinary Surgeons care not, and were not interested until you, Mr. Editor—an army man—had the barefaced effrontery to write that "leader" of yours referred to by me; and now, four years afterwards, we have action taken by a feeble few. May the little beginning lead to a large ending, as the old proverb goes.

When our present Principal went in for the reform he is wont to speak of, wonderful it appears, he failed to see the pernicious effect of the "Competition" on the graduates; and having arranged for higher fees from them, offered them some commensurate return "for bringing him more money," and better education. . . . . Pardon me, my dear Sir, I must heave a sigh. . . . Was all this done by our dear old Principal for the cause of science, elevation of our profession, and the attainment of better pospects and position in Society for our young graduates?

You observe, truthfully, in your leader referred to, "the subscribers are all men of opulence;" if they contract thus with the poor we could understand it, for it is next to "nothing" as a charge, and if a learned professor assesses his fee by contract thus, as a teacher, at what amount will the public assess the fee of the taught?

The system is damaging, not only to the interest of the profession in general, but the College also. I believe the students are injured, for how many valuable and interesting cases would the College acquire from the metropolitan practitioner, did they but exist on terms of friendship and esteem, having interests in common, and all working for one common end or object, "the advancement of scientific and practical research combined." A far better prospect for advance than the system of competition! What chance has a graduate, however well educated, against such a collegiate system inside, and the acquisition of all the most choice appointments outside? Surely this can be no inducement for young men of good family to join the profession. And you must offer some fair inducement; for a young man who now embarks in practice has a very uphill road before him, and unless he stoops to associate with groom or coachman, he fails to get support; for his "diploma" does not give him that social status which will warrant him to approach the owners. So, what with higher fees and education, the competition inside and out of the College, a young man of good family should hesitate before he steps into the profession, for the return is quite inadequate as things now are.

However, all this can, by honest effort, be put in order, and then we must see what can be done to stay the opprobrious remarks cast on us, as to our obtaining a sound knowledge of Cattle Pathology—*vide Mark Lane Express*, Monday, June 2nd, under heading "Agriculture in South Hants."

Speaking of the mortality among the sheep and lambs, the heavy loss to the flock owner by this, and gaps in wheat and growing crops, a writer says, "I wish that country doctors went in for the study of animal diseases. The Veterinarians, as a rule, are hopelessly ignorant."

Now what are we to say in reply to such a sweeping remark in an agricultural paper of wide circulation? Our College has no practical course of study; where, then, are the students supposed to acquire it? How the new arrangement will satisfy the examiners and Royal Agricultural Society, time will show; but surely more rational means for obtaining a knowledge of the ox, cow, sheep, and pig, will be discovered, than the perambulation of teacher and taught in a cattle market. Goodness knows what the dealers and drovers will say!

My letter has now exceeded the usual limit, yet it is with reluctance I put down the pen. Before I do so, I would ask your readers to peruse your "Editorial," or leader, in November, 1875, "Journal," between this and next meeting.

During the twenty-five years I have been in the profession, I have seen much improvement, and hope ere I quit it to see the "road" made smooth for those who are to follow me, and that the remark the late Mr. Mavor once made, "that they manufacture Veterinary Surgeons at Camden Town, and then starve them to death by ruinous competition," can never be repeated.

I am, dear sir, yours, etc.,

ROBERT WARD, F.R.C.V.S.

London, W., *June 10th*, 1879.

ON THE DETENTION IN THE UTERUS OF THE ŒSTRAL PRODUCTS IN THE LOWER ANIMALS.

To the Editor of the VETERINARY JOURNAL.

SIR,—I have to thank Mr. MacGillivray for taking up the above subject, which was opened by me. When I did so, I did not intend to appear again upon it, as my experience of this disorder was limited; but as Mr. MacGillivray, in his criticism of my remarks on the case which I recorded in the *May* number of this journal, has misconstrued certain terms, I feel called upon to give an explanation.

The suggestion of scrofula as a cause for the excess of the fluid found in the uterus, in my case, was purely hypothetical, inasmuch as there was no concomitants to warrant such for a certainty.

My employing the term "scrofulous matter" in a rather desultory manner has led Mr. MacGillivray to misinterpret my meaning. By "scrofulous matter," I meant "scrofulous" pus (or pus depending upon a scrofulous cachexia). That the latter may be formed upon a mucous surface without lesions essentially scrofulous, is a fact too well known to require further comment from me.

The mucous membranes of scrofulous subjects are very susceptible to disordered action, and the mucous membrane of the uterus exceptionally so, the slightest cause sometimes producing a purulent discharge. From this, coupled with the character of the contents of the uterus, which were purulent, I was induced to favour the theory of scrofula.

The reason I did not mention the smell of the fluid in my case, was because I did not come into possession of the uterus until three days after the heifer had been slaughtered; and after so long a time, in hot weather, the smell would not be the same as it would have been when taken from the body. But I have a distinct recollection of what it was like, viz., slightly putrefactive, but offensive.

I cannot agree with Mr. MacGillivray that the colour of the fluid in my case is confirmatory of his theory of the earlier periods of menstruation, as the colour is really nothing to go by. If Mr. MacGillivray will review the cases recorded on this subject, he will find that the colour of the fluid is almost as variable as the "shades"; and, indeed, this is compatible with his

own argument, when he asserts that a change takes place in the retained products; this induces an abnormal secretion from the mucous membrane (which is generally much in excess of the œstral products), either dropsical or purulent, and this, in my opinion, is what makes the colour so variable.

I corroborate Mr. MacGillivray's observations as to the character of the œstral products found in the uterus when an animal has been slaughtered whilst rutting; but I never found the quantity amounting to two ounces. This might be accounted for by the animals being slaughtered during the earlier part of that period. As they belonged to a butcher, and had been bought recently, I was unable to learn when they came in heat.—I am, sir, yours respectfully,

GEORGE GRAY.

Bakewell, *June 14th.*

THE PROVISIONING OF MEN AND HORSES DURING WAR.

To the Editor of the VETERINARY JOURNAL.

SIR,—Although England loses considerable quantities of horse-flesh which is suitable for the alimentation of the public, yet well-informed people know perfectly well that in France this flesh is sold and eaten like that of the ox or sheep, and that what can serve as nourishment on this side of the Channel may also be employed in the same way on your side. It think I am entitled to be heard on this point. But what appears to be less known, even in France, is that during war, and on every occasion when necessity demands it, horses, cattle, and even sheep may be *nourished with the flesh of animals* of their own kind. England having at this moment several armies in the field, I believe it will be useful, with a view to diminish the privations and sufferings of men and horses, to make known the following *résumé* of experiments made by M. Laguerrière, a French Military Veterinary Surgeon, during the siege of Metz:—"1. There are occasions when it becomes imperative to utilise the flesh of every animal which has *died* or been *killed*, for the sustenance of horses. 2. The repugnance of the horse to flesh is far from being so great as is generally believed. By a simple preparatory training, in diminishing the ordinary ration, or even in suppressing it altogether for one or two feeds, horses can be rapidly accustomed to a flesh *régime*. 3. Horses perfectly digest either raw or cooked flesh, even with more facility, and especially more completely than they digest vegetable substances. 4. Horses fed on flesh thrive, fatten, and gain in vigour and energy if this substance is given in addition to the ordinary daily ration, or even as a substitute for a large portion of that ration. 5. The flesh may be given raw to a certain number of animals, but it is preferable to cook it completely by boiling it, when it can be given in the form of draught. 6. Cooked or uncooked, the flesh should be very finely divided, reduced to hash, then triturated and mixed with other more or less alimentary substances chiefly destined to serve as a vehicle: leaves of trees, vines, straw, hay, gorse, grains, roots, or any other vegetable productions. When circumstances permit, some common salt should be added. 7. Only a very small quantity of flesh should be given at first, and the allowance should be progressively increased. I have given as much as two and three kilogrammes daily per horse, and then the flesh formed almost exclusively the diet. 8. Certain horses readily eat the flesh-mixture from the hand, and for the majority it is better to employ the *musette*. For others it is preferable to place the mixture on the ground or in the manger, if the latter is present. 9. Several horses at once eat morsels of raw flesh if it is only dusted with bran, flour, or grains, or placed between tree leaves; while later these same animals take the flesh without the slightest preparation. 10. Finally, if horses absolutely refuse the animal *régime*, it will be easy to overcome their

repugnance by drying the *cooked* flesh, reducing it to powder, and making it form part of the composition of prepared bread with salted vegetable substances."

I ought to add to the above, that M. Laguerrière had made numerous experiments before recommending, in cases of extreme necessity, the use of horse or ox-flesh as horse food. I am convinced that in the unfortunate campaign in South Africa, the English army might profit from the preceding observations, and this is my reason for making them known. I am aware that people placed in ordinary conditions will laugh at my proposal to make horse eat horse; but it is not for these persons that I write but for soldiers, and for horses dying from hunger, as I have witnessed them so frequently during war, and especially in the Crimea, Africa, etc., while considerable quantities of horse-flesh were allowed to rot.

Yours most respectfully,

E. DECROIX,

Retired Principal Veterinary Surgeon, French Army.

[We sincerely thank our esteemed colleague for his valuable observations and hints, and urgently recommend them to the notice of Army Veterinary Surgeons and medical men, feeling satisfied that they may be remembered with profit should the circumstances alluded to ever occur in their experience.]

CORRECTIONS AND ANSWERS.

IN Mr. Merrick's paper in the last issue of the Journal, the dose of Chlorate of Potass should be two *drachms*, instead of two *ounces*.

AMATEUR.—The Secretary of the Royal College of Veterinary Surgeons will furnish a Register if you apply for it. In this country no examination or special qualifications are required in order to become a professor, or rather a teacher, at a Veterinary School. In France and Germany it is extremely difficult to obtain the post, and candidates have to give evidence of very exceptional abilities, either by competition or otherwise.

N.B.—We shall have much pleasure in alluding to the subject next month.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from J. W. Hill, Wolverhampton; J. Temple, Aberdare; W. Broughton, Leeds; J. R. Dewar, Midmar, Aberdeen; P. Beattie, Turriff, Aberdeen; A. Rutherford, Edinburgh; Dr. Dolan, Halifax; Professor Law, Cornell University; Professor Steel, London; S. Locke, Manchester; G. A. Banham, London; M. E. Decroix, Principal Veterinary Surgeon, France; T. H. Merrick, Kettering; G. Gray, Bakewell; G. R. Dudgeon, Sunderland; D. Hutcheon, Liverpool; Dr. Dolan, Halifax; J. McFadyean, Edinburgh.

BOOKS AND PAMPHLETS: *C. Werner*, Der Lungenrotz des Pferdes; *F. Peters*, Mechanische Untersuchungen an den Gelenken und dem Hufe des Pferdes; *C. S. Roy*, Report on the Pathological History of Epizootic Pleuro-pneumonia; *W. Haase*, Die Mondblindheit; *A. S. Taylor, M.D.*, A Manual of Medical Jurisprudence; *F. N. Otis*, Urethrismus.

JOURNALS: *American Live Stock Journal; Beilage zu den Veröff. des Kaiserl. Deutschen Gesundheit-samtes; Index Medicus; American Veterinary Review; Wochenschrift für Thierheilkunde und Viehzucht; Lo Studente Veterinario; Scientific American; Lancet; British Medical Journal; Journal of the National Agricultural Society of Victoria; Agricultural Gazette; Annales de Méd. Vétérinaire de Bruxelles; Mark Lane Express; Medical Press; Der Thierarzt; Farmer; Recueil de Med. Vétérinaire; Archives Veterinaire; Repertorium Der Thierheilkunde; American Veterinary Review; Deutsche Zeitschrift fur Thiermedicin.*

NEWSPAPERS: *Scotsman; Illustrated Australia; Melbourne Leader; Suffolk and Essex Free Press; Peterborough and Huntingdonshire Standard; Bilston Herald; Irish Times.*